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THE CANADIAN ENTOMOLOGIST.

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VOLUME V.

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The Canadian Entomologist.

VOL. V. LONDON, ONT., JANUARY, 1873. No. 1

—1873.—

It has been our custom at the commencement of a new volume to offer our hearty greetings to our friends and correspondents, to all who read the CANADIAN ENTOMOLOGIST,—to all, indeed, who take a kindly interest in the success of our journal and the welfare of our Society. This year we do so most cordially, with not a little pardonable pride, when we remember that it is for the *fifth* time. Four years and a half have elapsed since we ventured to put forth our diminutive first number that consisted merely of eight pages; with our last December number we completed our fourth volume and eight-hundredth page of Entomological matter!

A complaint has once or twice reached us lately to the effect that our publication was gradually becoming too technical, and consequently of decreasing interest to a large number of our readers, who, from various causes, are unable to become deep students of the science, but who take great delight in learning all they can respecting the economy and classification of the insects of the country. We must confess that the complaint is not unfounded, and that we have almost unconsciously drifted somewhat away from the design of the periodical. It has always been our intention and desire to meet the requirements, if possible, of two classes of readers—those, on the one hand, who are leaders in the pursuit of Entomology, and who, therefore wish to have presented to them in convenient form all discoveries of new species and other valuable scientific information that may from time to time be acquired by their fellows,—and those, on the other hand, who collect and study insects to some extent, but are not yet far advanced in the pursuit; or who merely regard insects as destructive or beneficial and therefore wish to know something about them; or, again, who take pleasure in learning all they can about these creatures without either collecting or specially studying them. To meet the particular requirements of all these various descriptions of readers would, of course, be a perfect impossibility in a periodical of such limited size as ours; at the same time we think that

something may be done for all who care for insects, without filling out pages too much with technicalities, and without losing sight of all additions to our knowledge by becoming simply "popular." To steer a suitable course between the Scylla of abstruse science on the one side, and the Charybdis of mere "popularity" on the other, is no easy task, and we fear has not yet been achieved by us. We hope, however, in the forthcoming volume to do a little better in this respect, and we look forward to a continuance of friendly aid from our correspondents in various quarters to enable us to overcome the difficulty. As a first step towards improvement we propose to present to our readers a series of illustrated papers on the common Butterflies of North America—with special reference to those found in Canada. We hope that we shall thus be enabled in time to furnish beginners in Entomology with a hand book that will enable them easily to identify any common butterfly and to ascertain where and when it may be found, what its larva feeds upon, and such other useful information as may be gathered into a short space. Owing to the difficulty there is in obtaining really satisfactory wood cuts of insects, and the time that is required for their production, we shall not be able to take up the different species of Butterflies in any systematic order, but only as we are able to obtain the necessary materials. We shall be very thankful, indeed, for assistance from our readers in this department; almost every one can help us with lists of species observed in his own neighborhood, or with notes on their time of appearance and disappearance, number of broods, larval habits, etc., etc.

The "Hints to Fruit Growers" that have been afforded by one of our Editorial Staff—Mr. Saunders—will be continued with greater frequency during the coming year; we are glad to learn from various sources that those already published have proved of much value to our horticultural readers.

As a further improvement, we should be pleased to receive correspondence from our readers upon general Entomological subjects of the day; for instance, at the present moment, upon the vexed, and we may surely say vexatious, question of nomenclature.

It will be a relief, no doubt, to the majority of our readers to learn that the reprint of Kirby's *Insects of the Northern Parts of British America* is now fast approaching completion, and will cease ere long to distress them with its constant recurrence. The whole will, when finished, be made up into a separate volume and be sold at a moderate price. We have no doubt that it will prove of much value to those who are unable

to obtain the rare and expensive original. The space thus set free we propose to occupy with translations of Guenee's Descriptions of Moths, and reprints of Drury and other old authors whose works can seldom be obtained by the student of the present day.

During the past year we have received valued contributions to our pages from a larger number of correspondents than ever before; while we beg to offer them, for ourselves and our readers, our very hearty thanks for their favors, we venture to express the hope that they will not relax in their investigations and contributions, and that many others also will feel disposed to join their ranks. Without such assistance the CANADIAN ENTOMOLOGIST would be but a sorry production, and could not long protract its existence.

Another species of support, our worthy Treasurer reminds us, is equally necessary for the maintenance and well-being of our publication—need we say that he refers to the grosser element of dollars and cents? Our rules require the payment of all subscriptions in advance at the commencement of each year; as the amount to each individual is but a single dollar, there ought to be no difficulty or delay on his part in forwarding it; the aggregate sum thus provided is, as all must be aware, a matter of great importance to us, especially as we do not receive the Legislative grant to the Society till about midsummer. The present number of the CANADIAN ENTOMOLOGIST will be sent to all subscribers on the list for 1872, who have not signified their desire to withdraw from membership with the Society; no further number, however, will be sent, unless the amount of subscription is meanwhile received. Pay your honest dues, friendly reader, and then you will not fail to have in one respect at least, what we heartily wish you in all respects, A HAPPY NEW YEAR!

ANNUAL MEETING OF THE LONDON BRANCH.

At the recent annual meeting of the London branch of the Entomological Society of Ontario, the following officers were elected:—J. WILLIAMS, President; M. L. MORGAN, Vice-President; H. P. BOCK, Secretary-Treasurer; F. OSBORNE, Curator.

An interesting and satisfactory report was presented by the Secretary-Treasurer, showing an increase of membership, and also showing the funds of the branch to be in a prosperous condition.

ON SOME OF OUR COMMON INSECTS.

PAPER NO. I.

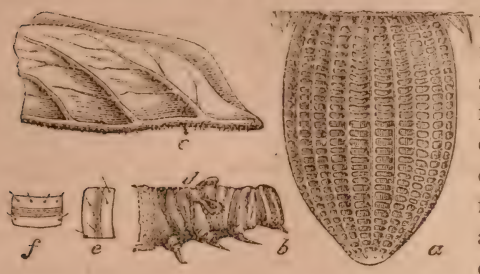
BY W. SAUNDERS, LONDON, ONTARIO.

This paper is the first of a series in which it is proposed, by members of the editorial staff alternately, to describe some of our more common insects, to illustrate them with suitable cuts, and to make the descriptions of so plain a character that the most unscientific reader may be able readily to comprehend their meaning. Since it is one of our aims in publishing the ENTOMOLOGIST to popularize our favorite science, we shall offer no apology for introducing into our journal these readable papers, in which much material may from time to time appear, which, to the scientific reader, may look stale and uninviting. In a recent letter from a correspondent who takes some interest in "bugs," but is not deeply versed in the technichalities of the science, he complains much of the depth of the learning which has been displayed in our pages during the past, and says that although he has frequently taken a plunge into the depths of the articles, one after another, that he has rarely been able to touch bottom. It will be our aim, then, while still devoting the larger portion of our pages to scientific matter, to introduce something into each future number in which subscribers of similar scientific calibre to the gentleman already referred to, may be able, not only to touch bottom, but to wander through the shallows with ease, and we hope with some degree of pleasure.

The first insect of which we propose to treat is one of our commonest butterflies, known as the *archippus* butterfly *(Danais archippus)*. This insect is said to hybernate during the winter; it is seen on the wing usually as early as the middle of May, but it is not very common until later in the season. These first few individuals lay their eggs on the leaves of the common milkweed *(Asclepias cornuti)* and other species of *Asclepias*, also on the bitter root *(Apocynum androsæmifolium)*, during the latter part of May or the beginning of June. The eggs, when fresh laid, are white, but in two or three days they become yellow and then dull gray just before the time of hatching. They are $\frac{1}{20}$th of an inch long, conical in form,

flattened at the base. When viewed with a magnifying glass they appear very beautiful. See figure 1, where *a* represents the egg much enlarged, while at *c* it is shown of natural size and in its usual position on the underside of the leaf. On this egg there are about twenty-five raised longitudinal lines, and about the same number of cross lines between each, so that the whole appears covered with a regular and beautiful net work, as shown in the figure, which has been drawn from nature, as those also have which are to follow, by our esteemed friend, Prof. C. V. Riley, of St. Louis, Mo.

Fig. 1.



In about six or seven days the egg matures, producing a minute caterpillar one tenth of an inch long, with a large black head, and yellowish-white body, with a few black hairs on each segment, as shown at *e* and *f*, fig. 1. This larva grows very rapidly, and soon finds that its skin will bear no further stretching, when it conveniently disrobes itself and appears in garb gay and new by crawling out of its skin through a rent down the back, which takes place just at the proper time, which process is repeated three times during its growth. At *b*, fig. 1, the head and anterior segments of the larva just before its last moult is figured for the purpose of showing how the long fleshy horns with which the mature caterpillar is furnished are conveniently coiled up when buried beneath the old skin.

The full grown larva, fig. 2, is about one and three quarter inches long. Its head is yellowish with a triangular black stripe in front below, and another of a similar shape above.

Fig. 2.

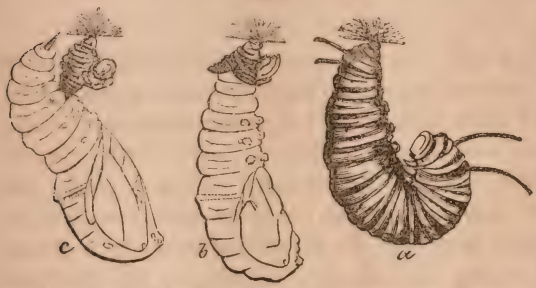
The upper surface of the body is beautifully ornamented with transverse stripes of black, yellow and white, the white covering the greater part of each segment, and having a wide black

stripe down its centre, while the yellow occupies the spaces between. On the third segment (reckoning the head as first) are two long black fleshy horns, and on the twelfth two others of a similar character, but shorter and not quite so stout.

The under side is black with a greenish flesh color between most of the segments.

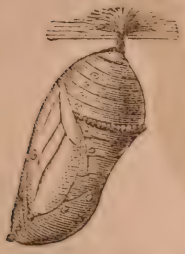
The next change which comes over this caterpillar is that which transforms it to a pupa or chrysalis, a most astonishing transformation, when the voracious larva becomes for a time torpid, senseless, and almost motionless while preparing for that change when it is to appear in brilliant plumage, and gracefully float and flutter through the air, enjoying the summer's sunshine and sipping the nectar of flowers. Fig. 3 shows the larva as it appears at different periods during its transition to the state of chrysalis. At *a* it hangs suspended from a silken web, in which its hind legs are entangled and which has been previously attached by the caterpillar to the underside of a leaf, or fence rail or some other secure place of retreat, and here while hanging for about a day the larva contracts its length, and increases its bulk, especially on the anterior segments. By and by a rent takes place in the skin down the back, and the chrysalis begins to appear, and after long and persevering efforts and much wriggling the skin is worked nearly up to the hinder extremity, as shown at *b*. Now a difficulty presents itself, and a feat is to be performed to imitate which would puzzle the most daring acrobat, for without hands or feet to hold on by it has to withdraw itself from the remnants of its larva skin, and hang itself up by a black protuberance covered with a bunch of hooks, with which the chrysalis is furnished. Perilous as this undertaking seems to be, it is very seldom indeed that a failure occurs in its accomplishment. A ready explanation of the means by which this is done is given at *c*, fig. 3. The joints of the abdomen being freely movable, are first stretched against a portion of the larva skin, when, by a sudden jerk backwards, the skin is grasped and firmly held while the terminal segments are withdrawn, and

Fig. 3.



the process of suspension completed. Soon after this the chrysalis begins a series of wriggling and jerking movements to dislodge the empty larva skin, after the removal of which it remains motionless, unless disturbed, and becomes gradually harder and more contracted until it assumes the appearance represented by fig. 4.

Fig. 4.



The chrysalis is about an inch long, and of a beautiful bright green colour dotted with gold, and with a band of golden dots extending more than half way round the body above the middle ; this band is shaded with black. There is a patch of black also arouud the base of the black protuberance by which it is suspended, and several dots of the same on other portions of the surface.

The insect seldom remains in chrysalis more than ten or twelve days, and towards the latter end of this period, the handsome green and gold colours begin to fade, the chrysalis growing gradually darker until the diminutive wings of the future butterfly show plainly through the semi-transparent enclosure. The escape of the imprisoned insect, now nearly ready for flight, is usually made quite early in the morning. We have several times watched for their deliverance, and have usually found it to take place soon after daybreak. A sudden crackling and slight tearing sound is heard, which arises from a splitting of the chrysalis case part way down the back, the fore legs, head and antennae are first withdrawn, and in a few moments the entire insect is liberated. At first the wings are very small, and the new born butterfly seeks at once some suitable spot where the wings may be held so as to hang down and thus facilitate the rapid growth which follows. This growth is truly amazing ; we have seen the wings double their size within three minutes, and seldom more than fifteen or twenty minutes pass before they have attained their full dimensions, and, ere the sun is high in the heavens, the soft, flabby wings have dried and the butterfly is ready for flight.

The *archippus* butterfly, fig. 5, is so well known that it needs but little description, especially when so good a figure is given. The ground colour of the wings, when fresh, is a beautifully bright orange red, the veins are heavy and black, and the margins are spotted with white, the latter being more or less covered or encroached upon by the general colour. Near the middle of the hind wings there appears in the figure on one of the veins

an enlarged black streak or blotch ; this, when closely examined, is found

Fig. 5.

to be a small excrescence ; it is found only in the male, and by this peculiarity the sexes may be readily distinguished.

We have frequently seen this butterfly in great numbers on pine trees which have been infested by *aphis*, attracted there no doubt by the sweet exudations which flow from the bodies of the *aphis*, thus interfering with the rights and privileges which have always been accorded to the industrious ant. They also have the fashion of congregating at times, late in the season, in prodigious swarms consisting of tens of thousands or hundreds of thousands of individuals. In September, 1871, we met with a swarm of this character on the shore of Lake Erie. They hung in clusters everywhere on a group of trees which they completely covered ; as many as thirty-two individuals were counted on a space of the size of ones' two hands, and their total numbers we thought might safely be estimated by millions. No satisfactory reason has yet been assigned for such gatherings.

SOME REMARKS ON CHANGES IN NAMES OF CERTAIN BUTTERFLIES.

BY W. H. EDWARDS, COALBURGH, W. VA.

PAPILIO ASTERIAS. Now sought to be changed to *Polyxenes*, although from the time of Fabricius to the publication of Kirby's Catalogue (1871), no other name than *asterias* has been in use. The species has been repeatedly figured as *asterias* in these hundred years, and under this name is well known to everyone who takes the least interest in these things.

What is gained by re-naming it, I am unable to see. The first mention of *polyxenes* was in Fab. Syst. Ent., page 444, No. 10, 1775, the male being described. Fabricius in 1787, in Mant. Ins., gives the same species under the name of *asterias*, referring to Drury, vol. i, plate ii, for the type, and quoting his own *polyxenes* as synonymous.

PAPILIO GLAUCUS. Under this name Linnæus described the black female of *turnus*, and it is only within the last ten years that it has been generally known that *glaucus* was related to *turnus*. When *glaucus* is now spoken of, it at once brings to mind this striking variety, and *turnus* var. *glaucus* is a sufficient designation and answers every proper requirement. It is eminently convenient that this variety should have its own designation, and by it, it is treated of in Wallace, Walsh, Darwin, Harris, and other authors. I hope our lepidopterists will not be deluded into changing these names by any supposed obligatory rule, for the simple fact is, there is no obligatory rule in the case.

DANAIS ARCHIPPUS. Mr. Kirby (1871) gives the name of this butterfly as *erippus* Cramer. Scudder (1872) gives it as *plexippus* Linn. Scudder in 1863 gave it as *erippus* Doubleday (But. N. England.) Mr. Scudder also read a paper by the late Dr. Harris before the Boston Soc. Nat. Hist. (1859) showing that these and other names were remarkably confounded, for example: "The *berenice* of Cramer is the *erippus* of Fabricius, but not of Cramer, and it is the *gilippus* of Smith, but not of Cramer and Fabricius; the *erippus* of Cramer is the *archippus* of Fabricius and of Smith; it is also the same as the *plexippus* of Cramer, but not of Linnæus and Fabricius: the *misippus* of Fabricius is the *archippus* of Cramer, but not of Fabricius and Smith: the *erippus* of Cramer is not the *erippus* of Fabricius, and the *misippus* of Fabricius is not the *misippus* of Linnæus." And he gives a table "by which it will be seen that the nomenclature of the three North American species has become confounded with five others." In preparing the Synopsis of Butterflies of N. Am., I had at hand all the above quoted works, and could make little of this tangle; and as our northern species of *Danais* has been generally known and written of and figured as *archippus*, I deemed it advisable to adhere to that name as one resting place in a foggy sea. It is so figured in Abbot & Smith, Boisduval & Leconte, and so called in Harris' Ins. Mass. 2nd Edition, which work I believe had the assistance of Mr. Scudder in preparing for the press.

LIMENITIS URSULA. Changed to *astyanax* by Butler, 1869, and followed by Kirby and Scudder. Fabricius' Syst. Ent., 1775, named the species *astyanax*. In Ent. Syst., 1793, he re-named it *ursula* for the following reason: It then stood in the genus *Papilio*, in which also stood another *astyanax*. He therefore changed the name of the first to *ursula*, and by this latter the species has come down to this day. It is so figured by Abbott & Smith, and by Boisduval & Leconte. That Fabricius was right in so changing the name to avoid a duplicate in the same genus, is undoubted, and although the species which still retains the name *astyanax* has since been found to be the female of something else, and hence loses its original name, there seems no good reason for disturbing *ursula*. Fabricius was right in making the change, and once right always right in such a matter. Of course I do not allow or believe that *proserpina* is a variety of *ursula;* it is as near *arthemis* as *ursula* in some respects.

ON THE LARVA OF PLUSIA BALLUCA.

BY W. SAUNDERS, LONDON, ONT.

In the second volume (1863.) of the Proceedings of the Entomological Society of Philadelphia, I published a paper on some of our Lepidopterous larvæ, and among other descriptions there appeared one purporting to be that of *Plusia balluca*. By some unfortunate mishap a description of the larva of *V. interrogationis* was sent in place of the intended one of *balluca*, and the mistake was not discovered until after the number had been issued, while all trace of the original description of the larva of *balluca* was lost. I did not again meet with this larva until the summer of 1871, when a fresh description was taken on the 15th of June, as follows:—

Length, 1.20 in.; body thickest on middle and posterior segments, tapering towards the front; the body is arched or looped along the middle segments when in motion.

Head rather small, bilobed, of a shining green color, with a few whitish hairs.

Body, above, yellowish-green, streaked and spotted with white, intermixed all through with green, thus dividing the white into a series of streaks, dots and broken lines; there is also a line of greenish-white on each side, close to the undersurface. Each segment has a few tubercles of a green color, striped with white; these are small on the second, third and fourth segments, but much larger from fifth to twelfth, inclusive, and entirely wanting on the terminal segment. On each of the hinder segments, with the exception of the last three, are ten or twelve of these tubercles, which almost cover the whole surface, and from each of the tubercles throughout there arises a single whitish hair.

The under surface is of a deeper green than the upper, with a few short whitish hairs, chiefly on 5th, 6th, 7th, 8th, 11th and 12th segments. Feet green, prolegs, of which there are three pairs, green also.

This larva became a chrysalis on the 18th of June, and produced the moth on the 13th of July.

In the caterpillar state, the insect feeds on the hop, consuming the leaves, but we have never known it to occur in sufficient numbers to do much damage. The moth, (see fig. 6,) measures, when expanded, about 1¾ inches. A large portion of the upper surface of the fore-wings is covered with brilliant, metallic green scales, which are darker on the lower portion of the middle and on the tips of the wings, and much paler towards the inner angle. The wings are covered by two oblique, irregular brown lines, and parts of the upper and outer portions are tinged with purplish. The hind wings are of a brownish dusky grey, without markings. The anterior portion of the body is pale brown, marked with buff and curiously crested above, the hinder portions of the body are paler. The under surface of both front and hind wings is dull, varying in shade from pale buff to brown, one of the brown lines on the upper surface of fore wings being reproduced and extended across the hind wings.

Fig. 6.

This moth has been found in various parts of Canada, but in no instance have we heard of its being met with in any considerable numbers.

MICRO-LEPIDOPTERA.

BY V. T. CHAMBERS, COVINGTON, KENTUCKY.

Continued from Vol. 4, Page 226.

ERRATA ET CORRIGENDA.—Ante vol. 4, p. 148, for *Hermonella* read *Hermanella;* p. 149, for *Alexandriacella* read *Alexandriæella;* p. 173, line 11, for "there" read "then;" p. 195, line 5, for "all the veins are united near the end of the cell," which is an unaccountable blunder, read 'all the veins given off from the cell arise near its end."

ANESYCHIA.

A. trifurcella, n. sp.

White; palpi annulate and tipped with dark brown or black; a longitudinal median blackish stripe on the thorax, and a spot of the same hue on each side of it; primaries white with a median wide blackish longitudinal streak beginning on the costa at the base, gradually widening to the apex, where two small white streaks or spots divide it into three short branches. Sometimes these white spots completely separate the outer branches from the median one. A row of small dark brown dots around the apex; a small spot near the dorsal margin about the basal fourth, and a larger one about the apical third of the wing. Antennae dark brown. *Alar ex.* $\frac{11}{16}$ inch. Kentucky, in July.

HYPONOMEUTA.

H. orbimaculella. Ante p. 88. Vol. 4.

This was described by me, *ante p. 42*, as *H. euonymella*, and the name changed because of its resemblance to the name of a European species, *H. evonymella.* I had not then seen the European species, nor any figure or description of it. Since then, however, I have seen the figure in Wood's *Index Entomologicus*, and think it most probable that this species is identical with it. The arrangement of the spots is identical, but in the figure of *evonymella* the fore wing is shaded with a smoky or brownish hue, while in all my specimens it is pure snow white; and the color of the hind wings in the figure is darker, and of a different shade from any of my specimens, in which the shade varies from snow white to lead color. I

incline to think that the maturity of the imago at the time of its death has something to do with the color of the hind wings, specimens killed very soon after emergence having them more slaty or lead colored than older ones.

ARGIOPE, *gen. nov.*

A. dorsimaculella.

Heribeia? incertella ante p. 44. Vol. 4.

In my former notice of this species I placed it, provisionally and with great doubt, in Stephens' genus *Heribeia*. I find, however, that either *Heribeia* Stephens is very different from the *Heribeia* of more modern English authors (which includes such small genera as *Philocnistis*, *Lyonetia*, &c.,) or I have mistaken the characters of Stephens' genus from his brief diagnosis. I had supposed it (from the characters given by Stephens and its location among his genera) to be allied closely to *Yponomeuta*. At any rate, as I cannot satisfactorily locate this species in any genus known to me, I think it best to erect a new one for it with the diagnosis given at p. 43—*Vol. 4.*

It differs from *Yponomeuta* in the colors and patterns of coloration; in having the terminal joint of the labial palpi a little larger in proportion to the others; in having the head entirely smooth; in having the primaries a *little* falcate beneath the apex, though the neuration is not materially different; in having the costal margin of the secondaries a little excised before the tip, which is pointed, and in having only a single branch (the superior furcate one) given off from the discal vein (while *Yponomeuta* has an inferior simple branch also), and in having the median furcate from the end of the cell, whilst in *Yponomeuta* it is simple.

GRACILLARIA.

G. blandella? Clem. *Proc. Ent. Soc. Phila., 1863, p. 9.*

Although Dr. Clemens' description is not strictly accurate, or rather, is not altogether intelligible, where applied to the insects now before me; and I have not seen his specimens, yet notwithstanding the close resemblance which sometimes exists between different species of this genus, I have very little doubt that my specimens belong to this species. Should it, however, prove otherwise, then I suggest for these specimens the name *G. juglandivorella* and annex the following description:

Face pale lemon yellow (or yellowish stramineous), palpi of the same hue, each joint of the maxillary palpi tipped with dark purple, the labial palpi thickly dusted with dark purple and with a wide dark purple annulus close to the tip. Vertex dark purple, with pale lemon yellow intermixed; antennae pale lemon yellow, faintly annulate with purple at the base, towards the apex purple, faintly annulate with pale lemon yellow. Thorax dark purple, with a narrow pale lemon yellow median longitudinal stripe, and a wider and more distinct one on each side above the wings, and a dark purple spot before the wings. Primaries pale lemon yellow and dark purple; the dorsal margin is dark purple from the base to near the ciliae, where the purple widens over the apical portion of the wing, except a small lemon yellow spot on the edge of the costal ciliae before the apex; costal margin from the base to the basal fourth dark purple; from the basal fourth of the costa a rather wide fascia passes obliquely backwards from the costal purple to the dorsal purple, uniting them, and thus enclosing on the base of the disc an oblong pale lemon yellow spot. Immediately behind the oblique purple fascia, the dorsal purple is excavated, and the wing is pale lemon yellow to the costa and as far back as the ciliae, with a little purple dusting or row of small purple spots along the extreme costa before the ciliae. Sometimes there is a faint golden or stramineous patch in the purple at the extreme apex, and sometimes the apex is a little dusted with golden or stramineous, Ciliae golden or stramineous, with three wide dark purple hinder marginal lines, one at the base, one in the middle, and one at the tip. (Perhaps they might be better described as dark purple, with two shining stramineous hinder marginal lines, one before their middle and one before their tip.) Posterior wings and ciliae dark purplish fuscous. Anterior and middle legs yellowish mixed with purple behind, dark purple in front except the tarsi, which are silvery white with each joint tipped with purple. Posterior legs yellowish except the apical half of the outer surface of the femora, the tips of the tibiae behind, and the tip of each tarsal joint. Thorax and upper surface of the abdomen dark purple; venter pale lemon yellow. In some lights what I have called dark purple appears violaceous or iridescent, and the stramineous portions appear golden or sulphur yellow. *Al. ex.* $\frac{11}{16}$ in. Kentucky.

Dr. Clemens received his specimen from Virginia. I have bred it from the leaves of the Black Walnut (*Juglans nigra*). It mines the upper surface, and, when first taken, was supposed to be the mine of a *Philocnistis*, containing a pupa. It was something more than an inch long, a little crooked, very narrow, and resembled a small snail's track.

Not far from one end the mine was widened a little and the cuticle puckered, forming a small nidus like that of a *Philocnistis* pupa. Within this nidus a small larva was visible. It was white, with the head pointed before, but widened behind, and with the thoracic segments much swollen and tapering rapidly from thence to the tail. (There is a good deal of resemblance between the very young larvae of *Gracillaria Philocnistis* and *Lithocolletis* of the cylindrical group.) In a day or two it changed its form, becoming cylindrical and pale yellowish white, and it left the mine and went to the *under* side of the leaf, where it turned down the edge over it, and, after eating out the parenchyma, turned it down in another place, repeating this operation two or three times until it finally became a pupa under the edge last turned down. Sometimes (at least in the breeding jar) it leaves the leaf and pupates under a sheet or coverlet of white silk like *G. salicifoliella* and many other species. Which mode it follows in a state of nature I am unable to say, having never found it in the pupa state. *G. juglandiella mihi* mines the *under* surface of the leaves, but the mine is larger and more blotch like, and when it leaves the mine it goes to the *upper* side of the leaf which it curls *upwards* over itself and there passes the pupa state. I do not mean to say that this habit of going to the side of the leaf opposite the mine is universal in either species, but only so far as I have observed it in some ten specimens of each. *G blandella* is a very handsome species.

A BALLOON SPIDER.

BY WILLIAM COUPER, MONTREAL.

"The American Naturalist" for May, 1871, contains an interesting article on "Flying Spiders," by J. H. Emerton. The species noticed by him are, no doubt, allied to the gossamer of Europe, and the phenomenon occurs early in autumn on the Islands of the St. Lawrence.

During the month of July, 1871, while trout-fishing on a large lake near the Upper Assumption, about one hundred miles north of Montreal, my attention was drawn to an inflated transparent substance of an oblong cocoon shape, passing about fifty yards over my head. To this miniature balloon, a thread was attached, and, on tracing it downward, its architect was seen struggling on the surface of the lake. Taking up the

paddle and forcing the canoe in order to secure this curious spider, imagine my disappointment, just as I was within a yard of it, to see it swallowed by a trout. The day was fine, with just sufficient wind to waft a delicate body of this nature across the lake. My curiosity being aroused, I kept a good look out for another specimen, but no more were seen that day.

On another lake further north, and during similar weather, I was pleased to witness a number of these in their aeronautic excursions, and on a rock in the centre of the lake was fortunate in capturing a specimen of the spider. In size it is as large as the house spider. The body and legs are densely covered with stiff hair; its mandibles are long and sharp. It was extremely active, and lived about three weeks in a box after its capture. I am at a loss to account for the mode in which this spider produces the structure with the extraordinary length of attached thread, which it manages to send off in the air. The woods near the lakes are principally pines, which are moss-covered and rugged, and yet, these curious balloons are evidently constructed on trees on the margin of the lakes.

ON THE GEOGRAPHICAL DISTRIBUTION OF SOME GENERA OF CANADIAN INSECTS.

BY FRANCIS WALKER, LONDON, ENGLAND.

The following communication includes two genera of *Chalcidiæ*, *Perilampus*, and *Callimome*. *Perilampus* is known in America from Canada to Mexico. *P. hyalinus* Say, inhabits Canada; *P. cyaneus* Brulle, and *P. Entellus* Walk. are synonyms of it. Say has described two other species, *P. platigaster* and *P. triangularis;* the latter is distinguished from all other species by the dark tips of the wings. *P. Alexinus* Walk. differs from *P. platigaster* by not having a brassy tinge, by the luteous tips of the femora, and by the luteous tibiæ with a black band. The specimen of *P. Lepreos* is too much mutilated to ascertain if it agrees with *P. platigaster*. *P. hyalinus*, above mentioned, has some resemblance to the European *P. violaceus*, but has an elongated scutellum; in this character it is far exceeded by the Mexican *P. gloriosus*, which far surpasses all other known species in size and beauty. *P. gloriosus* is also peculiar in the developement of the secondary veins of the forewings

and is still more remarkable on account of the long cubitus, that vein being very short in all the other species. In Europe this genus is represented from Sweden to Italy by a few species which are generally of rare occurrence and have been observed to be parasitic on wood-feeding insects. There are two species in S. Africa, *P. maurus* and *P. discolor*; the former is wholly black; the latter is distinguished from all others by pectinated antennæ, by a bifurcate scutellum, and by a concave abdominal dorsum. *P. Hedychroides* is a small Ceylonese species, and *P. Salcius* from Australia, is the smallest species of the genus yet known.

Philomides, Haliday, is another genus of *Perilampidæ*, and is only represented by *P. paphius* Hal., a native of Cyprus. The genus *Psilogaster* Brulle, is placed by that author next to *Perilampus*.

Callimome consists of much smaller insects than those of the genera of *Chalcidiæ*, before mentioned, and some species are abundant in England. None have been reported in Canada, but the genus is doubtless there, as it occurs both to the north and the south of that region. Two species have been found near Hudson's Bay. One of them, *C. cecidomyæ* is most allied to the British *C. euchlorus*; it is parasitic on *Cecidomyia spongivora*, which forms galls on the willow. The other, *C. splendidus*, should be placed next *C. purpurascius*, with which it agrees in its stout structure. The species collected by E. Doubleday, in the United States, appear to be different from those described by Say, and a few more from the same region have been lately published by Osten Sacken. The British species are very numerous, and, as to the female, may be most obviously distinguished from each other by the comparative length of the oviduct. The chief district of the genus seems to be now N. Europe, the known species of Australia and S. America being small and scarce. Some are natives of E. Siberia or Amurland, and it is probable that the more Southern parts of Asia were the earlier habitation of the present European species. Their instinct induces them to act so that their young ones may live at the expense of gall-making insects, and there is much to observe in the mutual adaptation of the size of the gall and the length of the oviduct, and as to what species are exclusively reared in one kind of gall or are developed in several kinds, and whether differences of habitation have any effect on outward appearance. The many-chambered galls are more interesting than those with a single cell. Some ten or twelve species of *Callimome* resort to oak apples and effect lodgments for their eggs at depths proportioned to the length of their oviducts; the species which

has the longest oviduct obtains possession thereby of the grub in the central part of the gall for the maintenance of its young ones, and the latter have a longer life in the gall than the young of the short oviduct species. The different species thus dwell in different concentric circles of the gall, and observations may be made whether there is mutual agreement as to the boundary lines between their respective territories, or whether complications occur between them when they have removed the earlier inhabitants. Many other species of insects dwell in these galls, and there is also much yet to be ascertained in the domestic habits of each one, whether herbivorous or carnivorous.

MISCELLANEOUS.

GENERIC NOMENCLATURE.—Can not some method be devised to check the recently introduced habit of rehabilitating fossil genera?

To borrow a geological simile, these had their little day of life in the Eozoic period of entomological science, proved themselves unfitted to survive in the struggle for existence, and then disappeared—it was to be hoped, forever. Is it not taking a very unfair advantage of the older authors to make them responsible for genera of which they had no conception, and which certainly would have been indignantly repudiated by them?

What a change, for example, from *Papilio* of Linnæus, an overgrown genus, capable of containing whole shoals of its lesser successors to *Papilio* Linn., *teste* Scudder, applying solely to one insect, already well supplied.

If Mr. Scudder's proposed revolution in our nomenclature should be adopted, I fear that also, on the other hand, the laboratories of the "genus grinders" will resemble the mills of the gods in one respect, and in one only, namely, that of "grinding exceeding small." If every genus has a single type, then, as species differ structurally more or less, what can be more evident than that each species is in itself the type of some genus, and immortality as enduring as that of Eratostratus is within the grasp of the man who grinds out his genera with the greatest rapidity!—THEO. L. MEAD.

ATTRACTING LEPIDOPTERA.—At page 194, vol. iii, CANADIAN ENTOMOLOGIST, attention is drawn to a new French method of collecting Nocturnal Lepidoptera by means of bait.

Having purchased chemicals, &c., for the purpose of thoroughly testing it at Anticosti and Labrador, last summer, I give my experience with the hope that it may be of service. Dried apples, such as recommended, were immersed in Nitric Ether, and hung on branches of trees on the second day after my arrival on Anticosti, and I visited the baits that night and each succeeding one during my stay on the Island. Moths were flying in the vicinity, and several passed within twelve inches of the bait, but only *one* was noticed to rest on it during the season. The baits on Anticosti and Labrador were constantly visited by Diptera and ants, and these alone. My want of success discouraged me, and I resolved to add sugar to the bait, and it was only with this addition that moths were attracted. I think, therefore, that the old mode of sugaring is still the best for this country. My friend, Mr. Caulfield, tried it here last summer with a like result.

It occurs to me that a bait might be prepared to attract Diurnal Lepidoptera. I passed two months of the summer of 1871 on the Black River, about 140 miles north of Montreal. I resided in a shanty on the new Colonization Road, which follows the river through the mountains. Water in which salt pork had been par-boiled, was thrown out on the sandy loam opposite the door, and I noticed that hundreds of *Papilio turnus* frequented this spot during favorable weather, thrusting their tongues into the moistened sand when the fluid absorbed, for which they seemed to have such an extraordinary liking, rendered them semi-intoxicated.

I have seen them flying from all quarters direct for the shanty. Many of them, I believe, came from a distance of two miles at least. The spot which these butterflies visited was certainly that on which the pork water was thrown, and the effluvia resulting from this was doubtless the great source of attraction. In A. R. Wallace's "Malay Archipelago," page 124, he says that the rare *Charaxes Kadenii*, a Java swallow-tail butterfly, was caught as it was sitting with wings erect sucking up the liquid from a muddy spot by the roadside, and I have seen several of our Canadian butterflies sucking the moisture from mud on the margins of ponds made for the use of cattle.

I intend to try a few experiments in suitable places next summer on Anticosti, &c., with water in which salt pork has been par-boiled, with various other substances added, and the results will be noted for the benefit of those concerned. Cyanide of Potassium is a quick destroyer of insect life, and I recommend it for night collecting.

As it is almost impossible to keep butterflies perfect on pins while moving from place to place in wild regions, each specimen of Diurnal Lepidoptera of my next collection will be placed in a paper envelope, and my subscribers will, no doubt, receive the remainder of their specimens in good condition. Moths will be pinned, and collected chiefly by sugaring, as I believe it is the cheapest and most prolific method of procuring good specimens. I am anxious to obtain three additional subscribers for the Northern Diurnal Lepidoptera, to be collected during the season of 1873.—WILLIAM COUPER, 38 Bonaventure Street, Montreal.

QUERIES.—John R. Smith, of South Pownal, Vermont, U. S., wishes to ascertain the best locality for *P. Luna* and *Ceratocampa regalis;* also if there is any published price list of American insects.

Will any of our readers kindly give the desired information?

A NEW SOCIETY.—We are glad to learn that a new Entomological Society has been started in Brooklyn, N. Y. We cordially wish it every success.

EXCHANGE.—Mr. W. Cole, of London, Eng., is desirous to enter into correspondence with Canadian Entomologists with a view of effecting exchange of specimens. For further information address W. COLE, care of C. Browne, Esq., 5, Old Square, Lincoln's Inn, London, England.

ADVERTISEMENTS.

The undersigned would like to exchange desirable Lepidoptera from North America, Brazil, India, Europe, &c., for species of *Lycænidæ*, new to him (from any part of the world.) Californian and Arctic species especially wanted. Address H. R. MORRISON, Old Cambridge, Mass., U. S.

JOHN AKHURST, Taxidermist, No. 19, Prospect Street, Brooklyn, N. Y., keeps constantly on hand for sale, Sheet Cork for insect boxes—size, 12 x 3½ x ¼; $1.25 per dozen sheets. Felt or German Insect Paper—size, 18 x 22 x ½; 50c. per sheet. Insect pins, French make; No. 2, 4, 6, 8, 10, 12, 14, 16, 18—$1.25 per 1000. Insects for sale or exchange. Dealer in Bird Skins.

N. B.—The above prices do not include the cost of transportation.

The Canadian Entomologist.

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SOME REMARKS ON ENTOMOLOGICAL NOMENCLATURE.

BY W. H. EDWARDS, COALBURGH, W. VA.

The papers on Nomenclature, lately published in the CANADIAN ENTOMOLOGIST, have much interested me, and doubtless many others, and as the subject is one that just now, for reasons well known, appeals especially to Lepidopterists, I beg to be allowed a little of your space to give my views thereupon, and to state what I believe is a practicable remedy for the evils complained of.

I am glad that this matter of Nomenclature was brought so prominently forward by the Entomologists present at the Meeting of the American Association for 1872, and that a Committee was appointed by the Entomological section to report a series of Rules for consideration at the next Meeting.

I apprehend that hitherto very little attention has been paid to Nomenclature in this country, at any rate in Entomology, and that when startling innovations are proposed, based upon assumed Codes or systems of Rules, very few know what such Codes or Rules are, or how far they are applicable or binding, or how they came to be enacted, with many other points of like nature. As applied, they seem incomprehensible to most persons, and even to the initiated have their difficulties. In the words of Alex. Agassiz, "The laws requisite for the correct name of an animal or of a plant have become as difficult to establish as the most intricate legal question." How such a discreditable state of things has come about, it is worth while to consider.

From an early period, Entomology, quite as much as its kindred Sciences, suffered from a disagreement as to names of species, one set prevailing in England, another in France, another in Germany, and so on. The first effort to secure uniformity seems to have been made in England by the Rev. Mr. Strickland, who, after consultation with other naturalists, drew up a Code of Nomenclature for Zoologists, that was

adopted by the British Association, in 1842. (I have been unable to obtain a copy of this Code, and only know its Rules as I have found them recited in various authors. On applying to Mr. A. G. Butler, Brit. Mus., I received the following reply:—"I can get no exact information as to when and where these Rules were published. At the time, they appeared in the report on the Meeting, and separate copies were struck off and distributed. Most of our Entomologists have either made copies of them or have seen them, and a few say they have printed copies *somewhere*."

This Code was not found to work altogether satisfactorily, and never did receive the general assent of Naturalists in their several departments. Prof. Verrill says, "The success of these Rules was but partial, even in England, for a considerable number of English authors have either ignored them or adopted them in part, often violating the most obvious and important Rules. In Conchology, especially, the violations have been lamentably numerous."

In 1865, a Revised Code was adopted by the British Association, which Code is printed at length in the Am. Journal of Arts and Science, July 1869, with valuable notes by Prof. Verrill. In this Revision some important changes were made, with a view to curing the defects of the original Code, and of gaining a more general acceptance. It is significant that Botany is recommended, by the Committee of Revision, *to be omitted from the operations of the Code.*

These two Codes may, so far as my purpose is concerned, be treated as one and the same, as the Rules that I consider obnoxious are found in both of them, and it is of their application to Entomology only that I have to speak, and more especially as affects the Lepidoptera.

The first Rule reads as follows:—"The name originally given by the describer of a species should be permanently retained, to the exclusion of all subsequent synonyms."

It is declared by those who are familiar with the facts, that the object of this Rule was not to drop out of sight all existing names in favor of a rejected or obsolete name, but to give the right to *that one of the names in use* that should be found to have priority of date.

For a period of years after 1842, it is asserted that such was the understood effect of the Rule, until a generation arose who knew nothing of, or overlooked the circumstances connected with its original proposal, and who took the letter of the Rule as their guide. And gradually there has

sprung up a class of authors who have devoted themselves with enthusiasm to exploring ancient works and forgotten publications of all sorts, in the hunt for the earliest recorded name to every species, by which to replace the name or names in use. The old authors had described but a few hundred species, and their descriptions were of the briefest. How brief, an average example from Linnæus will show :—"Papilio Troilus ; wings tailed, black ; fore-wings with pale marginal spots, hind wings beneath, with fulvous spots;" a description applicable, perhaps, to fifty species of Papilio. (This description at once misled Drury into giving the name Troilus to his figure of Asterias, to which it applies equally well.)

As new species were discovered, each of the earlier described having a group of close allies, many of these descriptions were no longer capable of identification, applying to numerous species as well as one. Then recourse was had to tradition, or to type specimens. The former may, or may not be trustworthy, and the latter is utterly untrustworthy unless the type agrees with the description. Dr. Staudinger says:—"It is unfortunately a fact that the acquirer of the Linnæan collection had the deplorable idea of sometimes replacing damaged specimens by fresh."

Mr. McLachlan says :—"It (this Linnæan collection,) was so maltreated by additions, destructions and misplacements of labels, as to render it a matter of regret that it now exists at all. Any evidence it now furnishes is only trustworthy when confirmed by the descriptions." Speaking of quite a modern collection, that of Mr. J. F. Stephens, Mr. Janson says :—"It not unfrequently happens that two, or in difficult genera, more species are mixed up under the same specific title."

And it is my opinion, knowing well the carelessness of collectors in the matter of labelling, some even who have described many species using no labels at all, but trusting to memory for identification of all their specimens, that a type specimen, or what was offered as such, if it disagreed essentially with the description, should be wholly rejected.

Besides the brevity of the old descriptions, many are defective from other causes. Often the two sexes received different names; often varieties were described as species ; often damaged and broken specimens were described as if fresh, the defects being cured by imagination ; often figures were made by unskilled artists, who omitted the specific characteristics, or the figures were colored so poorly as to be incapable of identification, or were copies from copies, or copies from memory, (for a curious illustration of this last, see Westwood, Trans. Lond. Ent. Soc.

1872, on Donovan's Papilios); and often descriptions were made from unreliable figures, instead of from the insect.

Now, with these and other disadvantages that might be mentioned, the authors who have undertaken to revise our Nomenclature have, each for himself, fixed on this or that description as applying to this or that insect, and there is frequent and serious disagreement between them. This will sufficiently appear by comparing the two Catalogues hereinafter mentioned, which, as to the names of British butterflies alone, that one might suppose had been settled long ago, differ as to the correct specific name to the extent of one-seventh of the whole number, as has been stated by Mr. W. A. Lewis, in his paper on Synonymic Lists. Lond. 1872.*

To complicate the case still further, there is a disagreement as to the date at which names shall be held to have first begun. Specific names did not originate with Linnæus, but that naturalist was the author of the binomial system of Nomenclature, and enunciated it in 1751. This was after his earlier works had been published, and even he did not fully apply the system till several years later. He re-described the known species of insects, using sometimes the names of his predecessors, but often re-naming, and very frequently changed a name given by himself in his earlier editions.

The question of a starting point, therefore, has very much exercised authors exploring for ancient names. And it is a very important one, and one above all others on which agreement would seem to be necessary, for many insects in 1767 bore different names from those given to them in 1758, and the latter from those of prior date.

Rule 2nd of the Code says:—"Specific names published before 1766, *cannot be used* to the prejudice of names published since that date;" and in the explanatory remarks, it is said:—"We *ought not to attempt* to carry back the principle of priority *beyond the date of the 12th edition* of the Systema Naturæ, 1766." (Vol. I., issued 1766; vol. II., in which are the insects, 1767.)

Mr. Kirby, in his Catalogue of Lepidoptera lately published (1870), follows the Rule, and would ignore all names prior to 1767. Dr. Staudinger, in his Catalogue of European Lepidoptera, also published

*Note.—See also a very able pamphlet by Mr. Lewis, entitled "A Discussion of the Laws of Priority in Entomological Nomenclature," Lond. 1872, which I advise all persons who care to make themselves better acquainted with the subject, to obtain. It may be had through the Naturalists' Agency, Salem,

in 1871, adopts the *10th edition* of the same work (1758), and says distinctly :—"*Every name given before 1758 loses its right.*" Others go back to various earlier dates. If the earliest Linnæan edition comes to be claimed as having a prior right over those that followed, as symptoms indicate, then there will be a sweeping away of landmarks, that will make the lesser floods hitherto experienced seem as nothing.

The result of all these efforts at stability, for that is the avowed object of the advocates of rigid priority of date, is extreme confusion,* instead of the agreement hoped for when the Code of the British Association was adopted, and students of one branch of Entomology at least are at a loss to know where the Nomenclature stands to-day, and are very certain that under the present order of things there will not be a name familiar to them that 20 or 50 years hence will not be supplanted under the claims of priority.

The Code of the British Association not only has not been adopted in detail by the British naturalists, who might be supposed to have given their assent to it, but it has not been adopted in other countries.† It is not the law of France nor of Germany. In the latter country, in 1858, a Code of Nomenclature was adopted by the Dresden Congress, in which the Rule on the subject of priority more sensibly meets the requirements

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* Prof. Verrill, in his comment on Rule 2, says:—"Disregard of this important and essential law (viz., *fixing the 12th edition as the starting point,*) has brought into Conchology, *and some other branches of Zoology,* an almost incredible amount of confusion."

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† "Notwithstanding the Rules sanctioned by the authority of the Brit. Ass'n, it would not seem that any perceptible improvement has taken place."—*G. R. Crotch, Cist. Ent., 1872*

Mr. Kirby has revised, &c., "in accordance with a series of Rules *selected from those issued* by the Brit. Ass'n for 1865."—*Wallace.*

Dr. Thorell "refers to the old Brit. Ass'n Rules with general approval, but differs from them in some important points."—*Ibid.*

Dr. Staudinger lays down eight rules that vary from those of the Brit. Ass'n or from Kirby and Thorell in several particulars. And Gemminger and Harold's Cat. Coleopt. differs in the Rules applied from all the others. *See Wallace.* As to French authors, the following extract of a letter to me from a distinguished English Entomologist will show how heterodox is their position :—"The chief confusion in generic Nomenclature is owing to the French, who consistently ignore or alter every thing done in other countries, on purpose to force their own names on the world in place of others."

of the case. "*The principle of preserving the oldest of the names given to the same insect is not absolute; the choice between them, following the greater or less degree of convenience, remains free.*"

Until quite lately, although there was a general feeling among Lepidopterists that the hunt for new names was getting to be a nuisance that demanded abatement, there seems to have been no active opposition to it, till the publication of the Catalogues of Staudinger and Kirby, and, in this country, of Scudder's Revision. The changes announced in these works amount to a revolution of much of the existing Nomenclature. In the Revision the names of American species have been changed largely, and of genera almost altogether. For example: of the Butterflies found in New England, out of 28 hitherto recognized genera (omitting the *Hesperidæ*) Mr. Scudder has left but three untouched; of five others he has retained the name, but restricted the genus; but of nineteen he has changed the names altogether, displacing well-known names by others purporting to have been found in ancient authors, and mostly in Hubner. And from the twenty-eight genera have now proceeded fifty-one. Whilst of the *Hesperidæ* he has made forty-five genera for one hundred and thirty-eight species, besides giving a horrid array of barbaric family and tribal names, remnants of systems ages ago deservedly exploded.

Mr. Kirby's "Revision has the effect of abolishing scores of old and familiar names (generic) and replacing them by others altogether new to the majority of Lepidopterists" *Wallace*; and Mr. Crotch, by following out his mode of determining typical species, "shows us that Mr. Kirby is wrong in the names of twenty-seven genera," defined before Hubner, and in a letter he says: "I stopped abruptly at 1816, as the question of Hubner's *Verzeichness* beat me," to which bewilderment we should be grateful, for the assimilative powers of that author are fearful.

The trouble caused by the strict application of Rule 1 to specific names becomes intensified when applied to generic names. It might be supposed in the hunt for the former, that if the several authors now at variance could be got to interpret the ancient descriptions by the same illumination, and could agree upon a starting point, the ultimate name of each species would some day be reached. It might require a long period, but it would seem possible. Not so with genera. Even when the final stage of disintegration was reached, and each species stood in a genus by itself, there would be a never-ending contest as to whether such genus should bear

the stamp of Fabricius, or Latreille, or Hubner, and each successive "resurrectionist," as these exhumers of dry bones are irreverently called, would but glory in upsetting the platforms of his predecessors, and would prove to a nicety that they and their systems were all wrong. Now, it is a matter for admiration that, notwithstanding the imposing names attached to these generic creations, every one of them is the result of the labor of Brown, Smith or Jones, alive and industriously working, and that the ancient worthies, so honorably preferred, lived and died in happy ignorance of the progeny after ages would attribute to them.

Now, it is insisted by those who rigidly adhere to the application of the priority theory to generic names that the original name given to a genus must never be lost, no matter what changes are made with the genus, although to retain such name may be to attribute to its original author exactly what he did not mean, and perhaps never would have sanctioned.

Rule 4th says:—"A generic name, when once established, should never be cancelled in any subsequent subdivision of the group, but retained, in a restricted sense, for one of the constituent portions." And Rule 5th:—"The generic name should always be retained for that portion of the original genus which was considered typical by its author."

That is to say, Papilio of Linnæus embraced what is now divided into very many genera, and the name Papilio must somewhere be retained. What particular species Linnæus would have chosen for the type of the genus, had he foreseen its future disintegration, is not known, and in the absence of such knowledge, authors now would differ in selecting the typical species; and unless there is agreement on that, it is plain that nothing but discord can follow. Mr. Kirby says, following the Rules:—"In subdividing a genus, the original name should be restricted to the typical sections if this can be ascertained." I have asked of an eminent Ornithologist what would be done in such case in his science, and he replied as follows:—"It is our custom to take the *first name mentioned* by an author as the type of his genus, unless another be especially claimed; and, if this genus be subsequently subdivided, to insist that the original name must be retained for the *first species of the original list*, unless there are very grave reasons to the contrary. I notice, in the 10th edition of Linnæus, the first Papilio is Priamus, from Amboyna. I should, therefore, be inclined to maintain that the name Papilio should be retained for that first mentioned species, whatever else might befall the group. This being premised, the author engaged in overhauling a group has the right

to select any other species of the original section as the type of his new genus." Mr. Crotch says (Cist. Ent., 1872) "No genus can be considered defined until its type is indicated," but when this is not done by the original author, "I am not inclined to cut the knot by taking *the first species*, but to trace the genus historically until it has a type given to it;" and "Cuvier (1799) gives precision to the old genera by characterizing them and indicating their types."

Let us apply these *dicta* to Vanessa Antiopa as metamorphosed into Papilio Antiopa by Mr. Scudder. He says:—"The generic name Papilio was applied by Linnæus to all the butterflies at the foundation of the binomial system of Nomenclature. Fabricius, in his later works, restricted it to the Nymphales and *Papilionides*. Schrank was the next author to restrict the name, limiting it, in 1801, to most of the Nymphales."

By Rule 5, or by Mr. Kirby's Rule, the original name having to be restricted to the typical section, Schrank should have left it with some part of the Papilionides of Fabricius, for I suppose no one can doubt that the swallow-tailed butterflies were the typical section of Linnæus (Equites), even though his typical species may be in question. Had he bound himself by the ornithological dictum, he would also have restricted the name to the *Papilionides*, *Priamus* being the typical species.

By that of Mr. Crotch he would still have been restricted to the *Papilionides*, making *P. Machaon* the type, because Cuvier (in 1799) made this species the type of the genus *Papilio* (and so it is recognized to-day and I hope will be for all future time.)

But, says Mr. Scudder, "If the laws of priority have any force or meaning, I do not see how we can refuse to acknowledge the *claims* of Schrank. I select, accordingly, from among the species grouped under Papilio by Linnæus, Fabricius and Schrank, one of *the best known* European butterflies as most suitable for the type of the genus." And by this curious process, one of the *best known species* being selected as the type, we get the astonishing creation Papilio Antiopa.—(Scud.) And this is equivalent to enunciating another *dictum*, being the fourth on this head, by which the *best known* species of a genus is to be the typical. Moreover, such exceedingly minute definition is given to the new genus that it would appear to be impossible that a second species could ever be embraced within it.*

* I notice that Mr. Scudder speaks of the "insufficiency of their generic descriptions" being "the reproach of Lepidopterists." Mr. Wallace, on the other hand,

Now, here are four modes of determining the typical species of a genus, propounded by as many authors, and there may be others for aught I know to the contrary, all with the view of simplifying these sciences, under the operation of Rule 1. Is it strange that "an incredible amount of confusion" is the result?

Linnæus placed under Papilio the princes of the order, and no matter what restrictions may have been made hitherto, these hundred years, Papilio has always had a magnificent following, increasing in splendor as the years went on. And now we are told, in 1872, that, in order to save the *claims* of the hitherto unappreciated Schrank, who published his speculations in 1801, Papilio is to be ejected from his rich possessions, and made to share the rest of his unlucky days with the dingy Vanessan to whom hard fate and Mr. Scudder has driven him. No more the superb creature we have read of, with "glistering burganet," and "shinie wings as silver bright,"—"refreshing his sprights," in "gay gardins," "pasturing on the pleasures," &c.; but, like Clarion, "reduced to lowest wretchedness," his good times all over, he flits about in slums and nasty lanes—and there we leave him.

In the explanatory remarks to Rule 4, it is said:—"It is an act of justice to the original author that his generic name should never be lost sight of." By Mr. Scudder's new creation the name Papilio is so nearly lost sight of that it might as well disappear altogether. It is certainly no compliment to Linnæus to retain it.

And this brings up the whole question of the obligation of naturalists to adopt whatever system any one may propose. Clearly enough, the right of ignoring changes made in Nomenclature is recognized even by the most determined advocates of strict priority, when applied to their contemporaries. A genus is set up, and no one follows it. It happens constantly, and it seems to me that in this matter one's contemporaries are the proper judges of one's work, and that no reversal of their judgment may rightfully be looked for from posterity, and therefore the writings

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asserts that the definitions of a Westwood, or of a Doubleday, are "careful and elaborate." I was much struck on reading these words in Cope's Origin of Genera, page 6:—"The reader will often find introduced into diagnoses of genera characters which indicate nothing of this sort;" and these, "adjacent genera of the same series differ from each other *but by a single character*." From which it may be inferred that inordinate length of generic description is not commendable, and is not properly attainable.

of authors whose systems were rejected in their own day, and whose generic creations were ignored not only by contemporaries, but for generations afterwards, cannot properly be appealed to. If there was injustice done to them it is too late to remedy it, and justice at this late day means injustice to those in present possession, and whose title often has the strength of nearly a century's undisputed possession. We cannot judge of the circumstances that influenced the contemporaries of such authors, and with the views prevailing at the time, their judgment was right. Therefore, when Schrank, and Hubner and others, are sought to be reinstated, and a host of generic names set aside, the later injustice is worse than the first,—if there was any first, and of that we have no knowledge. Otherwise, fifty years hence a system or a genus proposed by an author of to-day, though rejected by every naturalist living, for defects that appeal to the sense of each one of them, may be reinstated in spite of such contemporary judgment.

It has become more and more the practice, for twenty years past, to ignore all genera created since Hubner, and to replace subsequent names by names taken from that author, who published a Catalogue of Lepidoptera, in which nearly every species stands by itself, in a division that, whatever it may be called, is not generic. Of course it is easy to apply one of his names to every genus that can be now created. By his contemporaries, and for a generation after his works were published, his fanciful divisions and fanciful names were rejected, and it is only of late years that some authors have discovered that in his works is a mine of wealth.

But on this head it is sufficient to give the words of an Entomologist whose authority is second to none. I quote from the annual Address (1871) to the Lond. Ent. Soc., by Mr. Alfred R. Wallace, President of the Society, and I quote at some length, as it seems to me desirable that American Lepidopterists should be made aware that Hubner's claims are not yet everywhere acknowledged:—"By far the most important and most numerous alterations are caused by adopting the names of an author who has long been purposely ignored as an authority for genera both by English and Continental Lepidopterists. I of course allude to Hubner."

"Such old names as Chionobas, Agraulis, Eresia, Godartia, Adolias, Polyommatus, Leptalis, Terias, Callidryas, Thestias, Anthocaris, with many more, are changed for others to be found in no other work than Hubner's obsolete and useless Catalogue. Yet this wholesale change

does not seem to be warranted by the Rules of the British Association. Rule 12th says:—"A name which has never been clearly defined in some published work, should be changed for the earliest name by which the object shall have been so defined." And in the explanatory remarks it is said, "Definition properly implies a distinct exposition of essential characters, *and in all cases we conceive this to be indispensable.*"

Now this Rule merely embodied the feeling and practice of naturalists, and it had been acted on for thirty years, before it had been formally enunciated, in this very case of Hubner, whose work had been systematically set aside as an authority by most European Entomologists, because it was felt that his so-called genera were mere guesses founded on *facies* alone,—happy guesses, no doubt, sometimes—but as frequently wrong as right, and wholly without such definition as was held, even in his own day, to be required to constitute a new genus. Boisduval expressly states this, and his non-recognition of Hubner's genera has been followed in almost all the great systematic works which have since been published. If we take Hubner's first four genera and the characters he gives them, we shall be able to judge of the reasons for this course. They are as follows:—

Hymenitis,.....upper wings half banded.
Ithomia,..... " " one-banded.
Oleria..... " " twice-banded
Thyridia,.....both wings banded.

Such a mode of defining genera, though it has the merit of being simple and symmetrical, is undoubtedly superficial, and it can only be by the purest accident that a group so characterized can correspond in extent to any real genus. * * * In Mr. Kirby's own work, we find Hubner's condemnation in almost every page, in the utter want of agreement between his groups and modern genera. The modern restricted genus Heliconius, for instance, contains species belonging to seven Hubnerian genera; Pieris comprises five, and Thecla twelve of these hap-hazard groups; while, in other cases, the species comprising Hubner's groups are divided among several unrelated modern genera. * * * * The names sought to be reinstated, rank as mere catalogue names for want of proper definition, and should therefore never be quoted. * * * Even as a matter of justice it may be maintained that we should recognize the careful and elaborate definitions of a Doubleday or Westwood, rather than the childish guesses of a Hubner. * * * The proper course to be taken is to rein-

state every name which of late years has been made to give place to one of Hubner's, and further, to treat the *Verzeichniss bekannter Schmetterlinge* as a mere Catalogue, which can never be quoted as an authority for genera."

Now with regard to the remedy for the evil complained of. There have been various suggestions of Rules by foreign authors, many of which would meet the assent of most Entomologists, and it is easy to select from these authors both Rules and arguments for their adoption. I will call attention to so many of these suggested Rules as seem to me to meet the difficulty of the case, and to others, which might properly form part of a code, and will give short extracts illustrating them.

I mention them for the purpose of exciting discussion as to their fitness for the end in view, and that Lepidopterists may know what is the opinion of students in other branches of Entomology besides their own :—

1 There must be intelligible description and publication in case of a species, or a recognizable figure. In case of a genus there must be a definition giving the essential characters.—*From Dr. Thorell's European Spiders, quoted in Wallace's Address, before cited.*

2. In determining the priority of specific names, notice should be taken only of those works in which the Linnæan binomial nomenclature is exclusively and consistently employed.—*Thorell.*

Note—" The binomial system of nomenclature was fully and distinctly propounded by Linnæus in the *Philosophia Botanica*, published in 1751, and there can be no reason whatever why authors who adopted and systematically applied it should be set aside, because Linnæus himself did not apply it to the whole animal and vegetable kingdoms till 1758."—*Thorell.*

3. The same date should apply to generic as to specific names, both being characteristic of the binomial nomenclature, and it being impossible if we go back earlier, to determine what are to be considered as truly generic names.—*Ibid.*

4. Between two specific names in use, the prior right shall belong to the first named. *But no name in use shall give way to an obsolete or rejected name, even though the latter be of prior date.—Wallace's Address, p. 67.*

Note.—" The idea of justice to the namer or describer of a species is sometimes appealed to, but the law of priority is founded on no such

expressed idea, but rather on the universal practice of mankind, which always upholds stability of nomenclature, and requires cogent reasons of beauty or convenience to sanction its alteration. * * * * * *

"The proper Rule to adopt (instead of Rule 1 of Brit. Ass'n.) would have been *unchangeability of names in use*, rather than priority of date, which latter rule ought only to have been brought in to decide on the claims of two or more names in use, not to retain obsolete names never in use, or long ago rejected.—*Ibid.*

"What we want for the sake of knowledge is stability and uniformity of nomenclature, not an upsetting of it by the substitution of old, forgotten and very doubtful names, published in works without, or with very little scientific merit."—*Dr. Schaum, on Nomenclature of British Carabidæ, Ent. Ann., 1860.*

"The rule of priority in Nomenclature, I hold to be a good rule within its proper limits; it is not an unmixed good; and priority, like every other hobby-horse, may be ridden too hard. When the rule is strained beyond the reason for the rule, it becomes a nuisance,—nay more, it produces intolerable evil; but when reasonably applied, it produces more convenience than inconvenience. I accept it, therefore, as a rule for convenience, and nothing more, a rule adopted for the benefit of science, not for the glorification of name givers."—*F. W. Dunning, Ent. Mo. Mag., vol. 8, 215.*

"In systematic nomenclature the object is to register titles, not to gratify pride, and the names of authors are appended for convenience, not fame; the question of justice or injustice has no place here."—*Scudder, Am. Jo. Arts and Sci., 1872.*

"Both sides agree that the accord of Entomologists is the ultimate desideratum. I hold that the law of priority is not that the oldest name of an insect is invariably the right one, but that in cases of dispute, the prior name is to be preferred, and in such cases only; and that any attempt to subvert accord cannot be done under the law of priority, but we must make a new law—the law of *antiquity* say. * * * * In such event, every insect capable of identification must henceforth carry the name under which it was first called—no matter by whom—no matter the language. The American fire-fly must bear its Indian appellation—the 'Palmer-worm' and the 'Canker-worm' must have their 'prior' names restored; we must carry the law back without limit—even to chaos itself."—*T. H. Briggs, Ent. Mo. Mag. vol. 8, p. 93.*

"Nobody but a fool or a madman would try to persuade the modern New Yorkers to call their city New Amsterdam, or the English to have their letters addressed to Londinium, because these were the old original names. And yet, what men of the world would never dream of doing certain scientific men are doing every day."—*Walsh, Am. Ent., 1872.*

5. The name placed after a genus shall be that of the author who established the genus in the sense in which it is actually used.—Dr. Sharp, in Nature, Feb., 1872.

Note.—"Carabus of Linnæus included all the insects now comprised in the family Carabidæ, at present divided into several hundreds of genera. To write, therefore, Carabus, Linn., when we mean something else, may be usual, but is not desirable."—*Dr. Sharp, ibid.*

I do not deny to any author the right to establish new genera. Quite the contrary. But I would insist on these genera standing on their own merits, and claim for the Entomological world the right to accept them or not, as they choose. If any one thinks it worth while to break up Papilio, for instance, let him do so at his pleasure, but do not let him apply to the severed parts names taken from Hubner or other ancient author, in order to give these brand-new creations a smack of age, and so get the advantage of another author who may honestly put his name to his own work It is by this species of wrong that Nisoniades, Hubner has supplanted Thanaos, Boisduval; Oeneis, Hub. is trying to supplant Chionobas, Bois.; Polygonia, Hub. thrusts itself into the place of Grapta, Kirby, and so in cases innumerable.

Rules 4 and 5, if carried out, must put an effectual stop to the perpetual shifting of names.

Other Rules, which might properly form part of a Code, are as follows:—

6. The same specific name may be employed in genera sufficiently remote from each other.—*Staudinger, Cat.*

7. If a species has received different names for its sexes, that first given shall be retained.

8. The names of species should properly be Latin, or Latinized to the extent that renders them capable of being used in scientific Latin. But names once given are not to be altered or set aside for any defect or errors.—*Dr. Sharp, before cited.*

"It matters not in the least by what conventional sound we agree to designate an individual object, provided the sign to be employed be

stamped with such an authority as will suffice to make it pass current."—*Explan. Rem. to Rule 1.*

"The name originally given, even though it may be inferior in point of elegance or expressiveness to those subsequently proposed, ought, as a general principle, to be permanently retained."—*Ibid.*

9. The same generic name may be employed in Botany, but not in Zoology.

I have heard the objection to the application of the above Rules, that Entomologists have no right to separate themselves from other naturalists, and make a special Code for their own sole guidance. To this I would reply, why not? If it is found impossible to enact a series of Rules that will meet the requirements of the several branches of Natural Science, and the experience of thirty years shows that the thing is impracticable, why should not each branch adopt Rules to suit its own case? If Botany may be excluded from the operations of a Code, why not Entomology? It is very certain that in other branches than Entomology there is widespread dissatisfaction, and I believe an effort for reform in any direction will be met by general approval. At all events, as the dissatisfaction felt on this side the Atlantic has found expression, and a set of Rules is to be prepared as aforesaid, by a Committee of experienced Entomologists, it may be left to them to estimate the force of this and any other objection, and to report accordingly.

But Entomology is peculiar in one respect, and if there were no other reason, this alone would make it imperative that its votaries should resist strenuously unnecessary changes in Nomenclature, even if, by so doing, they should separate themselves from other naturalists. This is the only branch of Natural History that is becoming thoroughly popular through organized effort. Not to speak of Europe, the Governments of the United States, and many of the individual States, and Canada, employ professional Entomologists, who make frequent Reports that are printed by authority, and widely disseminated with the view of rendering the people intelligently acquainted with their native insects. Several Magazines have been published, which are exclusively devoted to the same subject, and the numerous agricultural weeklies or monthlies set apart a portion of their space for Entomology. Professedly, the object is to give information upon insects injurious to vegetation, but that includes, in one relation or other, every insect. The expensive treatise of Dr. Harris was published by the State of Massachusetts, and is everywhere a received authority. Packard's

Guide to the Study of Insects, has passed through three large editions, in as many years, and is rapidly becoming the text book used in our schools and colleges.

The result is that a vast degree of attention is concentrated upon Entomology, a hundred fold, I venture to say, more than upon Botany or Geology, and a thousand-fold more than upon Ornithology or Mammalogy. In these branches, therefore, a disturbance of names would affect scarcely any but special students, and if they do not care to resist innovations, it is not our concern. But, from the nature of the case, in Entomology, the advantage gained by disseminating information depends wholly upon the precision with which the objects treated of can be identified, and precision can result only from the use of a common Nomenclature. If one Treatise dilates upon the habits of an insect by one name, and the next Report under another, and anybody may shift about the names, specific and generic, at will, nothing can result but incomprehensibility and disgust. What man reading the history of Papilio Asterias, figured with all its preparatory stages, and colored to the life, in Harris, and the larva of which species he recognises as one of the pests of his garden, will comprehend what the Annual Report of his State Agricultural Society for 1873 shall say upon Amaryssus Polyxenes? or, his old acquaintance, familiar from boyhood, that he has been instructed to call Papilio Turnus, when he shall read about Euphœades Glaucus? Mr. Wallace well says, "Intelligible language is wholly founded on stability of Nomenclature, and we should soon cease to be able to understand each other's speech, if the practice of altering all names we thought we could improve upon became general."

I hope, therefore, that the Entomological section of the American Association, at its next Meeting, will adopt a new or amended Code, having in mind the exigencies of their own science only, and that full discussion and interchange of opinion having meantime been had, such Code will express the views of the great majority of the Entomologists of this continent. If the Rules are sensible, they will recommend themselves to the Entomologists of other countries, and in time secure general adoption.

ON SOME OF OUR COMMON INSECTS.

II. CABBAGE BUTTERFLIES.

BY THE EDITOR.

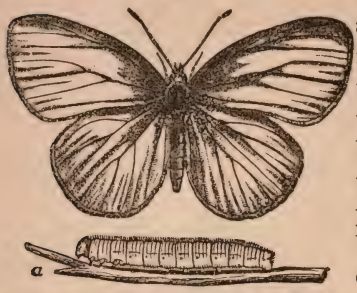
In pursuance of our plan of laying before our readers, from time to time, illustrated descriptions of the common insects of this country, we propose to begin in this number of our journal some account of the Butterflies belonging to the genus *Pieris*—familiarly known in their larval state as "Cabbage-Worms." As stated by our coadjutor, Mr. Saunders, in the first paper of this series (C. E., v., page 4), we do not profess to bring out any new facts or information of interest and value to the experienced Entomologist, but we wish to afford to our less scientific readers plain descriptions, with illustrations, of our more common insects, in order that any one beginning to collect and observe may be able to identify and learn something about what he meets with. Such being our object, we shall not hesitate to make use of all available information, whether derived from our own or extraneous sources, and shall not pretend to be especially original in our descriptions or remarks.

The genus *Pieris* is represented in Canada by but three species (*Oleracea*, *Rapæ* and *Protodice*), all of them white butterflies of moderate size, with more or less conspicuous black markings. The first-mentioned species, the Pot-herb Butterfly (*P. Oleracea*, Harris), is our native representative of the genus, being found all over the northern portion of this continent, from Nova Scotia and Maine in the East to the District of Algoma and even Manitoba in the North-West. It has been occasionally observed south of Lake Ontario, but very rarely as low down as Pennsylvania; at Ottawa, Collingwood, and other northern localities in Ontario, it is generally quite abundant every year, but it is seldom observed in any great numbers at Toronto or other places in the same latitude. When prevalent, it is usually to be seen on the wing from May to September, there being at least two broods in the year.

The *Oleracea* Butterfly (Fig. 7), may be at once distinguished from all other Canadian species by its almost pure white wings, destitute of spots or other markings on the upper surface; towards the tip and also next the

body the forewings are slightly discoloured with dusky scales. On the under surface the wings are sometimes of a yellowish hue, with the veins broadly marked with black or dark green; sometimes they are entirely white, with the veins merely faintly outlined in black; between these two extremes many gradations of shade may be observed. The pure white specimens found in the North West were supposed at one time to be a distinct species, and were described by Kirby under the name of the "Chaste Butterfly" (*P. Casta*); there is no doubt now, however, that these are merely varieties of the same species. The legs and body of the insect are black; its wings expand to a breadth of about two inches, but there is considerable variation in the size of individuals.

Fig. 7.



The butterfly, about the end of May or beginning of June, and again towards the close of summer, may be seen hovering over the food-plants of its larvæ, preparing to deposit its eggs. These are pear-shaped, or oval, of a yellow-green colour, and measure about one-twentieth of an inch in length, and a third of this amount in diameter; they are ribbed longitudinally with about fifteen sharp-edged lines. The parent deposits them singly, and rarely more than one on a leaf, on the under side of the leaves of the cabbage, turnip, radish, mustard and other plants of the order *Cruciferæ*. They are hatched in about a week or ten days.

The young larva is pale green, cylindrical in shape, and covered with short, whitish hairs. In order to escape from the egg it makes an opening with its jaws and then eats the shell until the aperture is large enough to admit of its easy egress; it subsequently devours the greater part of the shell that remains. At first the new-born caterpillar is less than one-twelfth of an inch in length, but it grows rapidly, until it attains its full size, about an inch and a quarter, in the brief space of a fortnight. The mature larva (Fig. 7, *a*) is pale green in colour, with numerous darker dots and a dark line along the back; it closely resembles the ribs of the leaf upon which it feeds.

When mature, the caterpillar forsakes its food plant and crawls away to some secluded spot, such as the under side of a stone or board, or a crevice in a fence or wall; there it spins a knot of silk to which it fastens its hindermost pair of feet; then it proceeds to form a loop of silk which

it dexterously fashions into a girth around the middle, and thus supported finally turns into a chrysalis. This is pale green or whitish, finely and regularly speckled with black, and in shape much resembles that of *P. rapæ*, of which an illustration will be hereafter given. In summer the chrysalis state lasts only a week or ten days, but in the case of the autumn brood the insect remains in this condition all winter and only comes forth as a Butterfly in the April or May following.

REVIEWS.

CONTRIBUTIONS TO ENTOMOLOGY FROM THE STATE OF NEW YORK. —Two works of value on the life history of various insects taken in the neighbouring State of New York, are before us; both of them emanate from official sources, and singularly enough, both appeared but a few months ago, though the Reports to which they belong have reference to the year 1869. The first to which we would draw attention is entitled "ENTOMOLOGICAL CONTRIBUTIONS," by Mr. J. A. Lintner.* It contains a remarkably elaborate description of the metamorphoses and whole life history of the handsome but rare moth *Hemileuca Maia*, Drury, occupying nearly twenty pages, accompanied by a lithographed plate of egg, chrysalis and imago, and constituting an excellent monograph of the species. This is followed by interesting observations upon various stages in the life of the butterflies *Melitæa Phaeton*, Fab., *M. Nycteis*, Doubl., and *Pieris Oleracea*, Harris. The author then describes, with illustrations, three new species of *Nisoniades*, named *Ixelus*, *Lucilius* and *Ausonius*; and a new Sphinx, *Ellema pineum*, which will probably be found in Canada, if it be not already in some of our collections under the name of *E. Harrisii*—a closely allied species. A list of forty species of Sphingidæ, another of over a hundred butterflies, and calendars of butterflies and moths, complete the author's observations. To these he has appended a very useful list, with references to volume and page, of all the North American moths, some 600 in number, described in Guenee's *Species General des Lepidopteres*. The volume is concluded by a translation from the German of a paper by Dr. Speyer on *Cucullia intermedia*, Spey., and *C. lucifuga*, W. V., to which Mr. Lintner has prefixed some notes on the larvæ. We have given a full account of the contents of this volume in order that the student may know where to look for very valuable contributions to our

* *Entomological Contributions*, by J. A. Lintner. From the twenty-third Annual Report of the New York State Cabinet of Natural History. for the year 1869. 8vo., pp, 90.

knowledge of the species referred to. We trust that Mr. Lintner will not relax in his efforts, but will continue to afford us year by year a complete record of his most pains-taking and accurate observations.

The other work, to which we have alluded above, is Dr. Fitch's Thirteenth Report as Entomologist of the State Agricultural Society of New York.† It opens with a long account of the synonymy and natural history of the Bean Aphis (*A. rumicis*, Linn.,) followed by descriptive notices of the Black-lined Plant-bug (*Phytocoris lineatus*, Fab.,) the Lilac Measure-worm (*Priocycla armataria*, H. Sch.,) and a new species of the latter genus, *P. Johnsonaria*, Fitch. The remainder of the Report is occupied by a very long and minute account of the two Cabbage Butterflies (*Pieris oleracea* and *P. rapæ*), covering some six and thirty pages. The diffuseness of these notices leads one to wish that the talented author would extend his observations to some other department of economic Entomology, and afford us, as he is so well able, concise and accurate accounts of species that are not yet familiarly known. While upon this subject we cannot forbear complaining of the excessive difficulty there appears to be in obtaining Dr. Fitch's Reports; we have tried in vain to obtain his 10th, 11th and 12th, and only succeeded as a special favour in getting the one we have just noticed. We are sure that Entomologists would esteem it as a great boon were they permitted to purchase these Reports separate from the volumes of Agricultural Transactions, at some reasonable price. The Naturalist's Agency at Salem would, we should think, be an excellent and convenient depository for them.

The volume of 'Transactions' contains also an admirable account of "The Grasses and their Culture," by the Hon. J. Stanton Gould, illustrated by upwards of 70 beautiful lithographed plates.

For Sale.—A fine collection of named Shells, mostly marine—comprising about 1800 species, with numerous varieties and many rare shells. Also about 200 species of Corals and Radiates. The specimens are all in the finest order, having been selected with a view to their perfection and beauty. The collection embraces about 6000 specimens. For further information address D. W. Ferguson, Corner of Hester and Elizabeth Streets, New York.

† Thirteenth Report on the Noxious, Beneficial and other Insects of the State of New York. By Asa Fitch, M. D. Transactions of the New York State Agricultural Society for the year 1869. Albany.

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ON SOME OF OUR COMMON INSECTS.

III. CABBAGE BUTTERFLIES.

BY THE EDITOR.

The next species of *Pieris* on our list—the Rape Butterfly (*P. rapæ*, Linn.,) though an European insect, is rapidly becoming one of our commonest and most destructive species, especially in the Eastern portion of the Dominion. The history of its arrival near Quebec in some ocean steamship, its discovery by Mr. Couper in 1859, its capture in abundance at Quebec by Mr. Bowles, in 1863, and its subsequent rapid spread in all directions is probably well known to all our readers. It is needless, then, for us to dwell upon it here; we may merely state further that it had reached the city of New York in 1869, Halifax, N. S., in 1871, and last year it had come as far west as Belleville and Trenton, Ont. We fully expect to see it at Port Hope this year!

The Rape Butterfly, like the preceding species, is white, with a black dash at the tip of the forewings, a black spot on the front margin of the hind wings, and in the male (Fig. 8) *one* black spot in the middle of the forewings, but in the female (Fig. 9) *two*. The under surface of the forewings, in both sexes, is marked by *two* spots, corresponding to those on the upper surface in the female; in other respects the wings are much alike on both sides, except that beneath there is a tint of yellow at base and tip. Occasionally *male* specimens are found of a bright yellow colour, like our common Sulphur-yellow Butterfly (*Colias philodice*); to

Fig. 8.

this variety, which does not occur at all in Europe, Mr. Scudder has given the name of *Novangliae*, from the first observed specimens having been found in the New England States. Dr. Fitch gives it as his opinion that this colour is produced by seclusion from light (13th Report, p. 559), but we should think it much more probably caused by peculiarity of food. Mr. Caulfield, of Montreal, (C. E., iv., p. 203,) is stated indeed to have found the yellow colour displayed when the larvae had been fed upon mignonette. We must await fuller observations, however, before we can feel justified in adopting any particular theory upon the subject.

Fig. 9.

The larva (Fig. 10, *a*) of this Butterfly is, when full grown, of a pale green colour, finely dotted with black, with a yellowish dorsal stripe, and a series of small yellow spots forming a stripe along each side; its length is about an inch and a quarter. It feeds, like *P. oleracea*, upon various species of cruciferous plants, especially upon the cabbage, to which it is most destructive. In this case it bores down, when feeding, into the very heart of the plant and thus renders the vegetable quite unfit for food. It forms its chrysalis (Fig. 10, *b*) in the same kinds of situations and in a similar manner to the preceding species. In this state it remains, in summer, for from a week to a fortnight, but in the autumn it continues as a pupa until the following spring. There are at least two, perhaps three, broods in the year.

Fig. 10.

The ravages of this insect in Northern America are beginning to be somewhat checked by a parasite (*Pteromalus puparum*, Linn.); it belongs to the ichneumon family, and is a four-winged fly, about one-eighth of an inch long, with a golden-hued body and a bright green head.

The remaining species of *Pieris* found in Canada—the Southern Cabbage Butterfly (*Pieris protodice*, Boisd.)—is quite a rarity with us, though oftentimes very abundant in the western and more southern States. Last August we found it to be the commonest butterfly about Chicago and through the States of Illinois and Iowa. Like the other two species, it is white with black markings; the accompanying illustrations so well represent the butterfly

that we need not occupy our space with any special description. (Fig. 11, with the comparatively few black spots, represents the male. Fig. 12, the female, with its much more numerous and conspicuous spots and markings.)

Fig. 11.

The chrysalis (Fig. 13, *b*) is over half an inch in length, of a light bluish-gray color, more or less profusely speckled with black, with the projecting portions tinted with pale yellow or flesh color, and marked with large black dots. The caterpillar (Fig. 13, *a*) varies in colour from deep to pale bluish and green; it has four longitudinal yellow stripes, and is thickly covered with black dots. As in the other species there are two broods in the year, and the winter is passed in the pupa state. In the Southern States it is a very injurious insect, but here it is too rare to be more than an interesting curiosity.

Fig. 12.

Fig. 13.

Another species of *Pieris* (*P. frigida*, Scudder) has been taken in Labrador and on the Island of Anticosti, but it is not likely ever to spread much, or to be ranked amongst 'common insects.'

ON THE GEOGRAPHICAL DISTRIBUTION OF SOME GENERA OF CANADIAN INSECTS.

BY FRANCIS WALKER, LONDON, ENGLAND.

Isosoma.—So much has been lately written about this genus that it may be dismissed with a few words. The *Eurytomidae*, to which it belongs, were considered by Nees to be in a debatable state between the

Chalcidiae and the *Cynips* tribe, and though they are now fixed with the *Chalcidiae*, there is still matter for argument as to their maintenance by animal life, or by vegetable life, or as to how they are divided between these two means of existence. Nees mentions his discovery of a gall-making *Eurytoma*, and Girand announces his ascertaining the vegetable food of *Isosoma*, a fact afterwards observed by Moncreaff, but this genus has more importance in the U. States, where Harris, Fitch and others have been witnesses of its ravages on corn. But the most interesting part of its history is in Canada where a species occurs in grape seeds, and is remarkable not only on account of the singularity of its abode, but also by the contrariety of the sexes, one of them representing the carnivorous *Eurytoma*, and the other the herbivorous *Isosoma*, and thus one species figuratively combines the diminishers of vegetation and the controllers of such diminution. *Isosoma* is destitute of the metallic hue which is the especial ornament of its tribe, but possesses a compact and elegant form, a finely sculptured thorax, and a highly polished abdomen. It occurs in Australia, in Amurland, and probably in all the chief parts of the earth.

Pteromalus.—This genus is the last of the Canadian *Chalcidiae*, and thereby indicates what a multitude of discoveries in this tribe are yet to be made in Canada. It inhabits all parts of the earth, and the British species are exceedingly numerous. *P. puparum* is the type of the genus and has been long known in Europe. The chrysalis of a butterfly affords food and lodging for its young; it was found formerly near Hudson's Bay, and its appearance in the U. States has been lately a source of gratification, and it can hardly fail of being shortly recognized in Canada, having now the means of making itself known.

MICRO-LEPIDOPTERA.

BY V. T. CHAMBERS, COVINGTON, KENTUCKY.

Continued from Vol. 5, Page15.

G. eupatoriella. Ante p. 9. Vol. 4.

The former notice of this species was very brief and imperfect, having, as there stated, been made from a single specimen which had been untimely nipped from its pupa case. Since then I have bred and captured other specimens. It may be *G. Venustella* Clem., *Proc. Acad. Nat. Sci., 1860.*

p. 92, and re-described by Dr. Clemens, *Proc. Ent. Soc. Phila., 1863, p. 216.* It does not agree accurately with either of Dr. Clemens' descriptions, but it seems to be a somewhat variable species, though some of the most striking marks in my three specimens are not mentioned by Dr. Clemens. I therefore retain the above name for the present, at least, as Dr. Clemens gives no measurement for his species, and was unacquainted with its food plant. In the following description I have noted the points in which my specimens differ among themselves and from Dr. Clemens description.

Maxillary palpi and basal joint of the labial palpi dark brown; terminal joint white, with a dark brown annulus before the middle. (In one specimen the labial palpi are entirely white, except the annulus. Dr. Clemens' first description says: "white, with a blackish spot near the middle and one near the tip." His second says: "Second joint fuscous at its end, third with a broad fuscous ring.") Antennae brown; head white; thorax white, narrowly margined near the apex with dark brown, and a dark brown line beginning on the head and extending to the apex of the thorax. (Dr. Clemens does not mention this line nor the dark margins.) Primaries dark grayish brown. A white streak along the dorsal margin from the base to about the middle, where it is confluent with the first dorsal oblique streak. (In one specimen it does not attain the oblique streak. This oblique streak is not mentioned by Clemens, who simply says "the basal portion of the inner margin is white.") A small white dorsal streak at the beginning of the ciliae (not mentioned by Clemens.) A short white costal streak in the basal portion of the wing; another about the middle, extending to or crossing the fold and pointing towards the second dorsal streak. (Dr. Clemens calls this second costal streak a fascia extending obliquely across the wings and sometimes constricted or partially interrupted near the dorsal margin. If sufficiently interrupted, this would make my second dorsal streak.) Two narrow white fasciae in the apical part of the wing, the last one not oblique. (Dr. Clemens calls these costal streaks extended to the middle.) All these streaks are dark margined internally, and the two last named are continued into the dorsal ciliae (a mark not mentioned by Clemens.) A fifth white short costal streak at the apex (not mentioned by Clemens, unless this is what he means by "Ciliae—at the tip of the wings white, touched with black at the ends.") Ciliae of the general hue, with a dark brown hinder marginal line beyond their middle. Anterior legs dark brown, with yel-

lowish-white tarsi; middle pair like the anterior, except that there is a white annulation near the middle of the femora; another at its articulation with the tibiae, and another near the base of the tibiae; posterior legs whitish, annulate with dark brown. (Dr. Clemens says nothing about the markings of the legs and tarsi, but in his classification of his species by the color of the tibiae, he places *Venustella* in the section "without white tibiae.") *Al. ex.* ¼ inch.

The larva may be found in the leaves of *Eupatorium ageratoides* from July to October, but is rather rare. The mine is at first a short narrow white line, but ends in a large tentiform mine. It is on the under surface, and the larva frequently leaves one mine to form another. The maxillary palpi are a *little* larger in this insect than in *Parectopa robiniella* Clem.; and I have not examined the neuration of this species, but I think it is evident at a glance that they are congeneric. And I do not see how, with a species like this before him, Dr. Clemens could have placed *robiniella* in a separate genus. In fresh specimens of *robiniella* the head is *not* roughened. At p. 7, vol. 4, *ante*, I have suggested that *Parectopa* Clem. is simply Zeller's section of *Gracillaria* with eight marginal veinlets in the primaries. Zeller's section agrees nearly with Herrick-Schaffer's genus, *Euspilapteryx*. And a glance at a figure of *Gracillaria (Euspilapteryx) amogattella*, or *G. (Eupilapteryx) phasianipinella*, as figured by Stainton, *Nat. Hist. Tin.*, or the former in Woods' *Index Entomologicus*, settles the position of *Parectopa* so far as the *pattern* of coloration can affect it.

Many of the species of this genus, when very young, make linear mines. The mines of *G. plantaginisella* and *G. eupatoriella* are short, crooked lines, ending in the large tentiform blotches heretofore described. That of *G. salicifoliella* is a narrow white line, sometimes nearly straight and with lateral branches on the underside of Willow leaves; when it leaves this mine it again enters the underside, but passes immediately through to the upper surface, where it makes the large blotch mine. The statement at p. 20 *ante*, that it makes but a single mine, is incorrect, as it commonly makes two or three. The young larva is flattened, resembling somewhat a flat *Lithocolletis* larva. *G. purpuriella* sometimes pupates under a web, as stated *ante p. 28*, but usually in its cone. The complete cone sometimes occupies an entire leaf; the apex of the leaf is bent over, so that the left edge touches the right one, to which it is fastened; then the leaf is rolled spirally to the base, and the tip is used to close one end and the base the other, so that the whole leaf is utilized. Many of the

mines, however, are by no means so perfect. Possibly the form of the mine may be useful as indicating the affinities of the species. *G. desmodifoliella* Clem. at first makes a narrow linear short mine on the underside of the leaf, ending in a small tent mine, which is indistinguishable from that of *Lithocolletis desmodiella* Clem., in the same leaves; afterwards it leaves the mine and rolls the leaf downwards from the tip. The mines of *G. (Parectopa) robiniella* and *G. (Parectopa) lespedesæfoliella* Clem. resemble somewhat the mines of the older larvae of *G. salicifoliella*. The larval habits of the other American species are unknown, except *G. juglandisnigracella*, which makes at first a short linear mine ending in a white blotch on the under surface; at this stage it is indistinguishable from the young mines of some species of *Lithocolletis;* when it leaves the mine it feeds, and then pupates under the edge of the leaf turned up. I have seen no account of the European *G. juglandiella*. The Black Walnut *(Juglans nigra)* is naturalized in Europe. If it is the food plant of *juglandiella*, then *juglandisnigracella* or *blandella* may be the same insect.

ORNIX.

The species of this genus may be distinguished from those of *Gracillaria* by the roughened head, the somewhat broader primaries and the duller colors.

Many of the species resemble each other very closely, so that, as Mr. Stainton says, the specific characters are to be sought for in the ciliae.

"In early life the larvae are leaf miners and make mines on the *under* surface of leaves, difficult to distinguish from those of the genus *Lithocolletis*. Towards maturity, however, they abandon their mines and feed under a portion of a leaf turned *down* from its edge, which is bound closely with silk. When they are full fed a small portion of the edge of the leaf is turned over, and the larva weaves its cocoon within the cone thus made."—Clemens' *Proc. Ent. Soc. Phila., 1861. p.* The italics in this quotation are mine. Mr. Stainton gives substantially the same account of their habits. And I believe the species described below as *O. inusitatumella* is the only known species which has a different habit.

O. inusitatumella. N. sp.?

Dark iron gray, almost brown. Labial palpi whitish, with a dark brownish gray annulus on the third joint before the tip. Head dirty grayish mixed with brown. Antennae gray brown, faintly annulate with

white. Thorax and primaries dark iron gray, or brownish; primaries pale whitish gray along the dorsal margin, dusted with brown. A narrow, brown streak from the fold, which widens into three small spots, once near the base, once towards the middle, and once behind the middle. Seven (or eight?) indistinct pale costal streaks, the first before the middle, the last close to the apex; those in the apical part of the wing are longer than those about the middle, and extend nearly across the wing, and all are internally dark margined. A white spot at the extreme apex, very small, and followed by a minute dark brown dot, behind which is an indistinct brown hinder marginal line. Ciliae of the general hue. *Alar ex.* nearly ⅓ inch.

At the bottom of *p. 116, v. 3, ante,* I have mentioned a mine on the upper surface of the leaves of Haw trees, which resembles that of *Lithocolletis Virginiella* on the upper surface of Ostrya leaves; and which I then supposed to be the mine of an undescribed *Lithocolletis.* (As will be hereafter explained, there is no such species as *L. Virginiella*, and the supposed mine of that species proved to be the mine of *L. tritenœanella.* (But of that hereafter.) The mine on the *upper* surface of the Haw leaves proves to be that of the *Ornix* above described. This mine is white, with the frass scattered, and much of it attached to the upper cuticle. It is large and nearly circular, and when completed the leaf is folded *upwards. The larva never leaves the mine, but pupates in it, in a brownish-red cocoon attached to the upper cuticle.* I have never seen it on any leaves except those of *Crataegus tomentosa*, and never on those, except in one small piece of woodland containing about ten acres, near Covington, Kentucky. There they are very abundant, and I have found multitudes of them containing larvae and pupae, and empty ones with the pupa case projecting through the upper cuticle, from May to November. *I have never met with any other Ornix on the leaves of C. tomentosa.* It is a very difficult species to rear, as out of at least one hundred mines that I have gathered containing the larvae and pupae, I have succeeded in rearing but two specimens of the imago.

Dr. Clemens states that his *O. crataegifoliella* has the labial palpi whitish; and does not mention the annulus; and he says that the fore-wings have a few whitish streaks *in the apical part of the wing.* His description is scarcely sufficient to enable one to determine a species among those which resemble each other so closely as do many species of this genus. But if he had mentioned the annulus on the palpi, and had

not confined the whitish streaks exclusively to the apical part of the wing, I should have considered *captured* specimens of this species as specimens of his species, which he says also feeds on *C. tomentosa*. But then the habits of his species are those of the genus generally—that is, it leaves the mine and pupates under the turned *down* edge of the leaf.

Nor can there be any suspicion that my first surmise about the mine was correct, viz., that it is a *Lithocolletis* mine, from which I have failed to rear the imago; whilst I have bred an *Ornix*, which was unobserved in another mine on the same leaves. For in one of the instances in which I bred it, I placed, one evening, a single Haw leaf in a wide-mouthed vial, containing nothing else. The leaf was carefully examined, and contained nothing but the mine and pupa of this species. The next morning the *Ornix* had emerged, and its pupa skin was projecting from the mine.

I have, therefore, described it as a new species, notwithstanding its close resemblance to *O. Crataegifoliella*, which Dr. Clemens says feeds upon the same leaves, but which I have never found on or in them.

For the purpose of comparison with the preceding species, and with the one described afterwards (*O. prunivorella*), I here quote Dr. Clemens' description of his species.

O. Crataegifoliella, Clem., *Proc. Ent. Soc. Phila., Nov., 1861*, (p. 94 of Mr. Stainton's edition.)

"Labial palpi whitish. Head dark brown and gray intermixed. Antennae dark brown, faintly annulate with whitish. Forewings dark brown, with a purplish hue. Along the inner margin, from the base to the anal angle, whitish dusted with dark brownish. In the fold at the base is a dark brown streak, and a small blotch of the same hue beyond the middle, nearly reaching to the inner margin. Toward the tip are a few whitish costal streaks, and at the apex a small round dark brown spot in a whitish patch, with a circular dark brown apical line behind it; ciliae blackish gray. Hind wings blackish gray; ciliae rather paler. Abdomen blackish, tipped with dull yellow."

"The larva mines the leaves of *Crataegus tomentosa* (black thorn) in September, and becomes a pupa early in October, weaving a reddish-brown cocoon in a turned down edge of the leaf. The pupa case is thrust from the end of the cocoon at maturity, the imago appearing early in May. There is doubtless a summer brood, but I have not sought for it. The head of the larva is brown; the body greenish-white, with the dorsum

reddish-brown." This description of the larva suits the larvæ of a great many species.

O. prunivorella. N. sp.

Dark steel gray, almost brown. Labial palpi white, each joint tipped externally with dark steel gray. Antennae of the general hue, faintly annulate with whitish. Thorax and primaries dark steel gray, the primaries with about nine faint whitish costal streaks, the first near the base and the last at the apex, becoming gradually longer from the base to the apex, all faintly dark margined internally, the last three or four nearly perpendicular to the costal margin, crossing the wing *and uniting near the dorsal margin*, where they are very narrow and indistinct. A small black apical spot, behind which are three dark hinder marginal lines in the ciliae, the first of which is at their base, and becomes furcate in the dorsal ciliae, the second is at the middle, and the third at the apex of the ciliae. *Al. ex.*, ⅓ inch. Kentucky.

The larva mines the leaves of Apple trees (*Malus*) and Wild Cherry trees (*Prunus serotina*), making a large tentiform mine on the under surface, which can only be distinguished from that of *Lithocolletis crataegella* Clem., in the same leaves, by its larger size. It is at first a short crooked line, which ends in the large tentiform mine. It leaves the mine to pupate under the edge of the leaf turned down.

Lithocolletis crataegella, *Tischeria malifoliella*, *Aspadisca splendoriferella*, and so many larvae of larger moths feed indifferently on the leaves of *Crataegus*, *Prunus* and *Malus*, that I at first, when I bred this insect from Apple and Wild Cherry leaves, was inclined to suppose it to be *O. crataegifolietla* Clem., but a slight inspection shows it to be different, and I have never found it feeding on Haw leaves. Among other things which distinguish it from *O. crataegifoliella* and *O. inusitatumella* the posterior margin of the wings is not whitish, and it has three hinder marginal lines in the ciliae. It may be found in all stages through the summer and fall.

PERSONAL.—We are pleased to learn that Mr. Aug. R. Grote, one of our esteemed contributors, well known for his many valuable papers on Lepidoptera, has removed from Demopolis, Alabama, to Buffalo, N. Y., where he has undertaken active work in connection with the Society of Natural Science.

DESCRIPTIONS OF NORTH AMERICAN HYMENOPTERA, No. 5

BY E. T. CRESSON,

Continued from Vol. 4, Page 231.

Genus MICRODUS, Nees.

MICRODUS IMITATUS. *N. sp.*

♀.—Sanguineous, shining; head, antennæ, prothorax, surroundings of scutellum, pleura beneath, four anterior legs, including their coxæ, posterior trochanters and their tibiæ and tarsi, black; sides of mesothorax tinged with blackish; metathorax coarsely punctured above with four longitudinal carinæ, the two central ones approximate, flanks less coarsely punctured; wings uniformly fuliginous, with the usual hyaline angular streak beneath stigma; abdomen long, narrow, polished, with a purplish reflection; ovipositor longer than body. Length .37 inch.

Massachusetts. More slender than *sanctus*, with the mesothorax, scutellum and sides of pleura sanguineous; the metathorax is differently sculptured and the posterior tibiæ are black.

MICRODUS SIMILLIMUS. *N. sp.*

♂ ♀.—Pale sanguineous or fulvo-ferruginous; head, antennæ, the thorax, except metathorax and four anterior legs including coxæ, black: metathorax opaque, scabrous; wings fuliginous; tips of posterior tibiae and tarsi more or less fuscous; abdomen shining, suture between first and second segments very deeply impressed. Length .22–.27 inch.

New Jersey; Pennsylvania; Illinois. Much smaller than *sanctus*, which it closely resembles, and from which it is at once distinguished by the posterior trochanters not being black.

MICRODUS CALCARATUS. *N. sp.*

♀.—Sanguineous; head, antennæ, the thorax, except metathorax, four anterior legs, posterior trochanters and their tibiae and tarsi, black; four anterior knees, anterior tarsi except claws, intermediate tarsi except tips of joints, all the tibial spurs and apical joint of posterior tarsi, white or whitish; metathorax shining above, with carinae forming an elongate central area; wings fuliginous as usual; abdomen shining, second

segment with two finely crenulated, transverse lines; ovipositor as long as body. Length .25 inch.

Delaware. Allied to *sanctus*, but much smaller, with the tibial spurs and four anterior tarsi white.

MICRODUS DIVISUS. *N. sp.*

♂.—Sanguineous; head, antennae, pleura, metathorax, post-scutellum, four anterior legs, including coxae, posterior coxae beneath, their trochanters, tips of their femora, their tibiae and tarsi, black; metathorax roughly scabrous; wings fuliginous; abdomen depressed, smooth and polished, a broad, rather deep fovea on each side at base of second segment. Length .34 inch.

Illinois. Differs from *medius*, to which it is closely allied, by the color of the legs; the metathorax is more roughly sculptured, and the clear blotch beneath the stigma more obscure, while in *medius* it is very conspicuous.

MICRODUS AGILIS. *N. sp.*

♀.—Small, slender, black; tip of clypeus, labrum, mandibles and palpi yellowish; thorax shining, metathorax opaque, scabrous; wings hyaline, faintly dusky, iridescent; legs pale sanguineous, posterior tibiae yellowish, their tips, a narrow annulus near base, and their tarsi, blackish; three basal segments of abdomen pale sanguineous, remainder black, shining; ovipositor as long as body. Length .25 inch.

Massachusetts.

MICRODUS DISCOLOR. *N. sp.*

♂ ♀.—Small, yellow-ferruginous; antennæ entirely black; space between summit of eyes and two large spots on occiput, fuscous; most of prothorax, sutures of mesothorax, space around scutellum, sides of pleura and metathorax above, all more or less fuscous; metathorax transversely rugulose above; scutellum sometimes blackish, and the spots on occiput sometimes indistinct; wings pale fuscous, areolet very minute; legs honey yellow, most of tarsi, tips of four posterior tibiæ, tips of posterior femora and an annulus near base of their tibiae, blackish; abdomen opaque, shining beyond third segment, which is more or less fuscous; one specimen has the vertex, occiput and thorax entirely, the posterior tibiae except broad median annulus, and the first, apex of the second, and the third

segments of abdomen black. The ♂ varies from entirely ferruginous, except antennae and posterior tibiae, to almost entirely black. Length .14 inch.

Illinois. A very variable species.

MICRODUS PALLENS. *N. sp.*

♀.—Honey-yellow, shining; tips of mandibles and antennae black, scape reddish beneath; metathorax roughened, opaque, pubescent; wings pale fuscous, areolet sub-triangular; intermediate tarsi dusky, tips of posterior tibiae and their tarsi black; abdomen polished. Length .22 inch.

Illinois. Allied to *fulvescens*, Cress., with clear spot beneath stigma much less distinct.

MICRODUS LATICINCTUS. *N. sp.*

♂.—Small, black, shining; mandibles and palpi pale; metathorax scabrous; tegulae pale honey-yellow; wings hyaline, iridescent: stigma blackish; legs honey-yellow, posterior coxae dusky at base beneath, their tibiae yellow, broadly black at tips, their tarsi fuscous; abdomen shining black, first segment longitudinally striated, second yellowish, remainder polished. Length .20 inch.

Missouri. (C. V. Riley.)

MICRODUS CINCTUS. *N. sp.*

♂ ♀.—Small, black, shining; tip of clypeus, mandibles and palpi pale-yellowish; antennæ pale testaceous, more or less dusky toward tips, scape piceous; metathorax opaque, finely scabrous; tegulae pale; wings hyaline, iridescent, faintly dusky; legs honey-yellow, tips of posterior femora above black, their tibiae yellow, black at tips, with a narrow black annulus near base, their tarsi fuscous; coxae of ♀ generally entirely black, of ♂ entirely honey-yellow; abdomen black, polished, first segment opaque, second segment pale honey-yellow. Length .17 inch.

Illinois. Smaller than *laticinctus*, from which it is at once distinguished by the first abdominal segment not being striated.

MICRODUS ANNULIPES. *N. sp.*

♀.—Small, black, shining; clypeus, mandibles and palpi more or less pale-yellowish; metathorax rugose, somewhat shining; tegulae honey-yellow; wings hyaline, iridescent, stigma and nervures pale brown; legs

honey-yellow, anterior pair pale, posterior tibiae white, tips and a spot near base black, their tarsi black, white at base; abdomen polished black, second and sometimes base of third segment honey-yellow. Length .16–.18 inch.

Massachusetts; Pennsylvania; Illinois. Easily recognized by the white posterior tibiae annulated with black. It is closely allied to the two preceding species.

MICRODUS EARINOIDES. *N. sp.*

♀.—Small, slender, shining black; mouth pale piceous, palpi whitish; metathorax rugose, sub-opaque; tegulae honey-yellow; wings hyaline, iridescent; legs honey-yellow, posterior tarsi whitish, apex and spot near base black, their tarsi black, whitish at extreme base: abdomen black, depressed, polished, basal sutures of second and third segments sometimes pale. Length .15 inch.

Massachusetts; Illinois. Resembles *Earinus limitaris* in miniature.

Genus EARINUS, Wesm.

EARINUS LIMITARIS.

Bassus limitarsis, Say, Bost. Jour. Nat. Hist., i., p. 250.

♂ ♀.—Black, shining, with a short pale silky pile on face, pleura and metathorax; mesothorax not trilobate, feebly punctured; metathorax rounded, shining, disk with a narrow longitudinal groove; tegulae whitish; wings hyaline, iridescent, costal nerve and stigma black, nervures fuscous, areolet quadrate; legs honey-yellow, posterior tibiae pale, apex broadly and a narrow annulus near base black, their tarsi entirely black; abdomen narrow, depressed, polished, second segment with an oblique groove on each side behind which is a round swelling; sheaths of ovipositor thick, fringed with short dense black pubescence. Length .25–.35 inch.

Canada; Mass.; Penn.; Virginia; Illinois. Common.

CANONS OF SYSTEMATIC NOMENCLATURE FOR THE HIGHER GROUPS.

BY SAMUEL H. SCUDDER.

[From the American Journal of Science and Arts, Vol. III, May, 1872.]

Several years ago, the American Association for the Advancement of Science appointed a committee to reconsider the canons of biological nomenclature, and to report whether, with the growth of science, they required any additions or alterations. No report has yet been made, nor, so far as we are aware, is any likely to be presented, until the subject is again brought prominently forward and new instructions given. Professor A. E. Verrill has since republished * the Revised Rules of Zoological Nomenclature adopted by the British Association for the Advancement of Science in 1865, and has accompanied them by a few apt comments; in England, Mr. W. F. Kirby, in a paper read before the Linnean Society of London, has called attention to the extensive changes which a strict adherence to the laws of priority would cause in the generic nomenclature of butterflies; and quite recently has put the same into practice in his catalogue of these insects.

But hitherto very little has been said concerning the special application of definite rules to groups higher than genera, and it is to this division of the subject that we desire to call attention.

In attempting to legislate upon this branch of zoological nomenclature, two principles must be kept in view: *first*, so far as possible, the canons already in general acceptance for generic nomenclature should be applied to all the monomial groups. Unity of principle lies at the foundation of acceptable legislation; *second*, retrospective laws should be avoided.

One difficulty meets us at the outset,—what some are pleased to term the unstable nature of the higher groups, but which we should prefer to call the disagreement of naturalists as to the limits and value of these groups; yet as this diversity of view is a nearly equal hindrance to any code of rules, it needs only to be mentioned in passing.

Endeavoring to keep in mind the principles above enunciated, and as the simplest means of presenting our views, the following outline of a code is suggested for the consideration of zoologists.

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* This Journal, July, 1869.

Canons.—1. The name originally given by the founder of a group should be permanently retained, to the exclusion of all subsequent synonyms.

This rule, recognizing the law of priority, which lies at the foundation of all systematic nomenclature, is the same as the first and prime rule of the code accepted by the British Association, with the exception of certain references made exclusively to species; and, since this canon meets universal acceptance, there is no need of discussing it, aside from the following limitations.

1. This law of priority should not extend to works published before 1758.

The same reasons for such a limitation do not exist in the present instance as in the case of specific nomenclature; but similar objections can be made to an earlier limitation. Only three reasonable courses are open to the naturalist: to accept (*a*) no limitation whatever, in which case "our zoological studies would be frittered away amid the refinements of classical learning;" (*b*) the limitation here formulated, in which case all our systematic nomenclature takes its common origin in the tenth edition of Linne's Systema Naturæ;* or (*c*) to apply the laws of nomenclature to each kind of group (sub-family, family, class, etc.), from the time when such group was first brought into use—which would engender such confusion as speedily to bring all nomenclature into deserved disrepute.

2. Plural or collective substantives (or adjectives used as substantives) are alone admissible.

As the higher groups are all collective—in idea, if not in fact—it is essential that the names applied to them should be at least capable of a collective sense; and names which are not so formed should be dropped. The retrospective action of such a law would be very slight.

3. A name which has been previously proposed for some genus or higher group in zoology should be expunged.

This accords too well with accepted rules to require any discussion.

4. When two authors define and name (differently) the same group, both making it of the same or very nearly the same extent, the later name (or if synchronous, the least known name) should be cancelled, and never again brought into use.

* The English—the strongest upholders of the plan of dating from the twelfth edition of the Systema Naturæ—are now, by degrees, accepting the earlier date of 1758 as the starting point for zoological nomenclature, and we may assume that, in this view, the whole scientific world will sooner or later concur.

With the exception of certain verbal modifications, this law is identical with the sixth section of the British Association rules, where it is applied to genera only.

5. In any subsequent alterations of the limits of a group, its name should never be cancelled; but should be retained either in a restricted or an enlarged sense.

The necessity for such a limitation is obvious; otherwise a different name would (or, could) be given by every author who differed from preceding ones in his ideas of the precise limitation of any group in question. This indeed has already been done, and, if continued, will create lamentable confusion; but this limitation should itself be subject to one exception, which may be formulated thus:

6. But any assemblage so defined by an author as harshly to violate the groupings of nature (as known to naturalists of his time), should be cancelled.

Such a rule would prevent the injury which might accrue to science by too close an application of the preceding law. The parenthetical limitation seems, however, to be necessary.

II. Changes in the name of one group should not affect the names of other groups.

This follows as a corollary of the first canon, but it has been not infrequently violated, and it is easy to perceive the cause. The nomenclature of higher groups, notably of families and subfamilies, has, to a considerable degree, been founded upon generic names, with the addition of special collective endings to the root (see recommendation 1). Now, when a generic name which has formed the basis of a family designation has been found to be pre-occupied, it has been thought necessary by some to recast the nomenclature of the higher group. But why? After a name has been long applied to a group, it ceases to have any intrinsic meaning and is simply associated with the group itself, recalling it without reference to any particular member of the same. It certainly would be agreeable if we had a nomenclature in which each group should by the very association of ideas recall its members; but since that is utterly impossible, and we have to deal with a mass of synonyms already tangled and intricate, our problem is—how best to make our way out of the difficulty without a continual wrangling over names and entailing endless disputes upon future generations.

To this canon no exception whatever should be made ; for it would be difficult to draw the line anywhere and gain general consent. Anyone who considers the subject, will see that one apparently reasonable exception will lead to another scarcely less desirable, until the whole value and force of the proposed canon is destroyed.

III. The mere enumeration of its members, when known, is a sufficient definition of the limits of a group, and gives it an unquestionable claim to recognition.

Although it is certainly *most* desirable that every name proposed for a group should, when first propounded (or shortly after), be accompanied by a full description of its essential characters, it is evident that no one acquainted with the subject of which an author treats can fail to understand his meaning if he defines his groups by mere enumeration of their members. If, for instance, he designates the known genera to be embraced in a proposed family, he actually defines his group much better than he could do by a specification of its characters, since we have probably not yet been favored with any description of a natural family which gives everything which is characteristic and omits all that is not.

Recommendations.—1. "That assemblages of genera, termed families, should be uniformly named by adding the termination -idæ to the name of the earliest known or most typically characterized genus in them ; and that their subdivision, termed subfamilies, should be similarly constructed with the termination -inæ."

This recommendation, formulated by the committee of the British Association, is deprived of a great part of its value by the disagreement of naturalists as to the nature of family and subfamily groups,—assemblages of very diverse natures having received this designation at the hands of different writers ; indeed, up to the issue of Professor Agassiz's Essay on Classification, no one had ever attempted to give definite shape to current opinions upon the subject ; and it will be long before we shall see a general concurrence in either the views put forward in that work, or in any modification of them. Such being the case, it is evident that this recommendation cannot have the force of a law, nor be allowed any retrospective action. Otherwise these rules, or any other reasonable ones (however generally they may be accepted), are powerless to assign to any higher natural group a fixed and unalterable name ; but the group in question would receive a different name from different authors, according as they considered it a subfamily or an assemblage of still another nature.

2. All monomial collective names should be derived from the Greek, and have a plural form.

3. Only the surname of the author who first proposed a group need follow its name, whether the group be used in its original or in a modified sense; but when it is desirable to indicate at the same time its recognized altered limits, the surname of the writer who first proposed the accepted circumscription may follow in a parenthesis.

In systematic nomenclature, the object is to register titles, not to gratify pride, and the names of authors are appended for convenience, not fame; the question of justice or injustice has no place here; and yet the above recommendation ought to be satisfactory to those who view this matter in a different light.

NOTES FROM THE EAST.

PIERIS RAPÆ.—The yellow variety of this butterfly occurs here every summer, from the commencement until the end of the season; what I have seen of them were of a delicate sulphur yellow. I netted all that I met with, but never found a yellow female on the wing. In July, 1870, I had a pot of mignonette growing on my window-sill, and observed a *white* female *Rapæ* laying eggs on it. I reared seven or eight of the caterpillars, feeding them on mignonette, and they all assumed the pupa state; after the butterflies had emerged, a friend unfortunately opened the box and some of them escaped before I had seen them. When I examined the box there were five yellow females remaining in it. They had the dark markings very strongly produced, as the later broods generally have; not knowing at the time the scarceness of the yellow females, I did not preserve them, and I have not seen one since. I believe, with the exception of one reared by Mr. Bowles at Quebec, it is the only instance on record. Last spring I found some chrysalids of *rapæ* containing parasites, but did not succeed in breeding them, as the change from the cold of the open air to the warmth of the house killed them. Last summer *rapæ* was very abundant here, and now the chrysalids may be seen in great numbers suspended to the fences about the city. The parasite has increased wonderfully during last season, for nearly all the chrysalids that I have seen this year are infested with them. I do not think that more than one in fifty has escaped their attacks.—F. B. CAULFIELD, Montreal, P. Q.

MACROBASIS FABRICII.—This beetle was very numerous here last season, and did a considerable amount of damage to the potatoe vines; in

one field of potatoes that I examined I found on nearly every plant from two to seven of them, busily employed on the leaves ; their blue-gray dress contrasted well with the green of the leaves, and gave them quite a picturesque appearance. When disturbed, they did not attempt to fly, but let themselves fall from the leaves ; however, when on the ground they were active enough, and soon hid themselves under stones or lumps of earth. While on the plants they appeared to be very peaceable, keeping together in small groups, but on some occasions they are sad cannibals. A friend of mine brought me some of these insects in a paper, and when I opened it there was only one alive ; the rest of them were rather badly mutilated, some had lost their legs and some were minus their heads. I put them together again and the survivor immediately commenced a fierce attack on one of his slaughtered relatives, and did not seem one bit the worse after his strange repast.

DIAPHEROMERA FEMORATA.—I found this insect quite common here last summer ; they do not seem to be particular in their choice of trees in this locality. I found them on Maple, Linden, Oak and Butternut, and early in the season I found a young one making a tour of discovery on an Elm that I had sugared for moths. I found the males much more active than the females, stalking up the tree when disturbed, while the females either remained quiet or dropped to the ground, rarely going up the tree. —F. B. CAULFIELD, Montreal, P. Q.

HESPERIA ILLINOIS IDENTICAL WITH HESP. ACANOOTUS, SCUDD.

I am informed by the best authorities that under the name of Hesp. "Illinois," I have merely re-described Mr. Scudder's *Hesp. Acanootus*, and I therefore hasten to make the necessary correction.

In comparing my supposed new species with specimens and descriptions of N. A. Hesperidæ, I was misled in regard to *Acanootus*, (which I had never seen,) by Mr. C. S. Minot's description of that species on page 150, vol. iv, of the CANADIAN ENTOMOLOGIST, which will be seen to differ in several important particulars from my description of what now appears to be the same species.

The majority of the females taken here also differ in the spots on the primaries from the female of *Acanootus*, as first described by Mr. Scudder.

The few extenuating circumstances mentioned above, do not, however, relieve me of the blame of having, with injudicious haste, re-described an old established species.—G. M. DODGE, Ohio, Ill.

The Canadian Entomologist.

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NOTES ON CASNONIA LUDOVICIANA, SALLE.

BY S. V. SUMMERS, M. D., NEW ORLEANS, LA.

Long, .30–.33 inch. Body elongated, glabrous, sanguineous, pilose. Head, disk of prothorax, and under surface black; head rhomboidal, middle wider than thorax, thence gradually constricted into a narrow rufous neck; eyes large and prominent; mouth parts, three basal joints, antennæ and legs rufous; eighth and ninth joints of antennae white, remaining joints black; prothorax elongate, cylindrical, piceous; humeral base and apex rufous, widest just behind middle, when viewed vertically two fine long yellowish erect hairs will be observed to arise laterally just before the middle, much longer than on elytra. Elytra faintly striate, striae with fine distant punctures, from each arise a single yellowish erect hair; intervals smooth, flat, elytral constriction at humeri narrower than middle of thorax, humerus slightly elevated, angles rounded, a wide black band on middle of elytra, sinuated above, arcuate below, apex truncate and tipped with black; knees darker than femora, posterior thigh with outer two-thirds black.

I am unable to detect any sexual dissimilarity.

Its larger size and finer punctured striae before band on elytra, and the white eighth and ninth antennal joints, easily distinguishes it from *pennsylvanica*. The Californian *picta* is unknown to me.

Habitat New Orleans, La. Mexico. Rare.

This charming addition to our North American fauna appears first due to M. Salle, of Paris, France, who (if I am correctly informed) about forty years ago took a unique near an old Saw Mill, in N. O. Subsequently, none others were known to occur until 1861, when an individual was attracted by the lamp of a Mr. Speck, which ultimately became the property of Mr. Salle, making the second specimen in all Europe. Mr. Trabranelt, a diligent collector who has resided here some eighteen

years, took the next three specimens, one of which he has lately exchanged to Mr. Salle. Again, on Dec. 31st, '72, under some board traps in dry grass, near water, my first specimen occurred, and for three succeeding days a unique was taken. Their habits are probably gregarious, living on the ground, and as the collecting grounds in the vicinity of New Orleans are limited, owing to swamps, they may be found to occur more plentifully in Northern La. They are very active and graceful, taking alarm at the least noise, and run with great rapidity, keeping the antennae in constant vibration; when placed in a collecting bottle containing Cyanide of Potassium, they would seize hold of some other insect and proceed to drag it off, imitating certain species of ants. The drug, however, quickly quiets them.

ON MR. SCUDDER'S SYSTEMATIC REVISION OF SOME OF THE AMERICAN BUTTERFLIES.

BY AUG. R. GROTE., BUFFALO, N. Y.

[PAPER NO. 2.]

Since it is conceded that the law of priority is invariable in its application to zoological nomenclature, it remains for us to apply it to the determination of our Butterflies. That some inconveniences may arise from the correction of errors, does not militate against our desire to be right. The question is, are Mr. Scudder's genera well founded, or, are his names entitled to precedence, not is it convenient for us to use them. Without as yet entering an extended discussion upon the structural characters of our Butterflies, we will briefly notice Mr. Scudder's genera.

1. Oeneis, *Hubner* (1816.) The type and first species mentioned under this name by Hubner is *Norna*. While five species are cited under this genus, Hubner refers two more to Eumenis, viz.: *aello* and *tarpeja*. But the type of Eumenis is *E. autonoe*. It is difficult to avoid the conclusion that we must retain Oeneis to be correct, while regretting the necessary abandonment of Chionobas, so sonorous and accustomed a name. In our North American fauna we have, besides the species cited by Mr. Scudder, *Oen. chryxus* and *Oen. Uhleri*, described under Chionobas by Doubleday and Reakirt. Chionobas *Stretchii*, Edw., does not belong to

this genus, and is a synonym of Satyrus Ridingsii, I have been informed. *Oen. nevadensis* has been described by Behr.

2. Enodia, *Hubner* (1816). No one can possibly object to this designation for our *E. portlandia* on any score.

3. Minois, *Hubner* (1816.) This generic name has priority, and Mr. Scudder shows that it represents a distinct type. It cannot be objected to on any score. Besides *nephele* and *alope*, it includes *M. pegala*, *M. ariane* and *M. boopis*. The former is a Southern species, the *Papilio pegala* of Fabr., and thought to be a possible form of *M. alope;* the two latter are described by Behr under Satyrus.

4. Argus, *Scopoli* (1777). Mr. Scudder restricts Scopoli's term to our species, the *Hipparchia Boisduvalii* of Harris, enumerated under another name by Scopoli. To this procedure there is no objection, provided that Boisduval's types of Argus were not of those referred to the genus by Scopoli, which we cannot determine at the moment, when Boisduval's restriction would have priority. Hubner has, however, a Satyrid genus *Arge*, the type of which is *A. psyche*.

5. Megisto, *Hubner* (1816.) Hubner's type is *M. cymelia*, to which he refers Eurytus as a synonym. He includes in his genus Megisto Mr. Scudder's type of Argus. There can be objection to the use of the term if we do not follow Mr. Butler's Enlargement of Euptychia.

(To be Continued.)

NOTES ON THE HABITS OF THE ANT LION.

BY H. L. MOODY, MALDEN, MASS.

It was in April of 1872, while at Plymouth, Mass., with a party of friends in search of the Mayflower *Epigæa repens*, that I was so fortunate as to capture a specimen of the larva of this insect. It was quite by accident that it came to my hands. A friend and myself were lounging by the roadside, for want of better employment thrusting our fingers into the light sand, when with a jerk and exclamation my friend withdrew his hand to find this larva clinging with a most determined nip to a finger; it immediately dropped to the ground, however, and so quickly buried itself backward as to almost escape us, but a moment's lively digging revealed

it again, and I secured it in a pill box. On my arrival at home I provided a jar with a few inches of dry sand in the bottom, and placed the larva in it; it at once buried itself, and though I waited several hours, hoping to witness the commencement of its pitfall, there was no movement in that direction; there was now and then a slight stir of the sand, and once or twice the head was thrust above the surface, but quickly withdrawn at the slightest movement on my part. I grew tired of watching and retired for the night, returning in the morning to find a completed pit. It was in the form of an inverted cone, about one and one-half inches in diameter and three-quarters deep, and as smooth as sand could be made. At the first glance I discovered no sign of the builder, but a closer inspection revealed a pair of mandibles and at the base of them a pair of eyes; the bearer of these was snugly ensconced in the sand. The mandibles were stretched to their widest capacity and resting against opposite sides of the pit, so harmonizing in color with the sand as not to be readily noticed. In this position the larva would rest for hours unless disturbed, when it would withdraw from sight, but soon reappear and resume its watch.

My great interest, however, was in its method of taking its prey, and to witness this operation I provided a dozen or more ants of a small species, dropping them all into the pit at once; the larva with one sweep of its jaws secured three or four, and in a very short time killed or disabled them, but it soon dropped them and proceeded to kill most of the others before commencing its repast. Owing to their sluggish habit but very few succeeded in escaping. I was curious to see if the larva would attack as readily larger and more savage species, and the next day secured the largest specimens I could find of the Red Ant, *Formica sanguinea?*—noted for its courage and ferocity. I dropped the largest of these on the sand in the jar, leaving it to find its way into the pit, which it soon did, hesitating a moment at the brink and then walking to the bottom. At the instant that the ant came within reach the larva closed its jaws upon one of its legs, and for a few moments I witnessed quite an exciting contest, the ant turning and twisting to find its adversary and biting savagely at everything within its reach, the larva endeavoring to draw far back into the sand, thereby protecting itself and pressing the ant so close to the surface as to allow but very little room for movement. The ant finally freed itself from the jaws of the larva, but did not at once succeed in leaving the pit; the larva instantly almost entirely uncovered itself and slashed right and left with its mandibles, seeming to be in a perfect fury at

the loss of its prey. It also threw sand rapidly, but I could not see that the sand struck the ant except when it tried to escape up the side of the pit back of the larva; then the sand invariably struck it and brought it to the bottom. The ant finally escaped, but the next day was again caught and its juices sucked dry.

In no instance did I see so much resistance offered as in this case; usually the ants seemed to realize that their adversary was one with which they could not cope. From my observations I concluded that the larva trusted rather to its long mandibles and the inability of its prey to readily climb the walls of the pit, than to sand throwing where it did not capture them in the first attempt, for I saw it throw sand in but few instances. I did not see it in the act of digging its pitfall but once; it was then midnight and I did not stay to witness the completion. I noticed only that it threw the sand out with its head, working very rapidly. I have sometimes left the room to return in less than an hour to find a completed pit where before there was no sign of it. From the day of capture to May 11th I kept it supplied with ants, of which it destroyed numbers every day, but on the latter date, either by design or accident, its pit was filled level with the surface, and from this time to the time of pupating it dug none, remaining hidden most of the time and but once taking any food, then capturing an ant while concealed by a few grains of sand. On June 4th it constructed a round cocoon of silk, covered with grains of sand, and about one-half an inch in diameter. I presume it immediately pupated, but did not open the cocoon to ascertain. On July 8th the imago appeared and proved to be *Myrmeleon immaculatus*.

In the larva state it is certainly in some respects the most interesting insect I have ever seen, its very activity and pugnacity exciting admiration; its mandibles were always ready to close upon any intruding object. When I first obtained it I wished to preserve a description and in order to accurately observe the colors I was obliged to remove the fine grains of sand that were entangled in the short hairs on the body; this I did with a camel's hair brush, an operation to which the larva decidedly objected, but it stood its ground and fought it out, constantly seizing the brush between its mandibles, often in its attempts to reach it springing quite clear of the table.

DESCRIPTIONS OF NORTH AMERICAN HYMENOPTERA, No. 6

BY E. T. CRESSON,

Continued from Page 54.

Genus Toxoneuron, Say.

The characters of this genus are given at length under the name of *Tenthredoides* (Proc. Ent. Soc. Phil., iv., p. 290), which appears to be synonymous. It may be easily recognized by the short robust body, rather large transverse head, stout legs, broad ample wings (which are generally fuliginous), and especially by the form of the marginal cell, which is rather suddenly constricted (or somewhat reclivate) at tip of second sub-marginal cell, and thence narrowed to the apex, which is somewhat incurved, and reaches the extreme apex of the wing; this, as well as the second and third submarginal cells, are indistinctly defined, the nervures being sub-obsolete.

The species, thus far known, may be distinguished by the characters given in the following table:—

Body entirely black.
- Wings entirely fuliginous.
  - Legs black, anterior knees honey-yellow.
    - Tibial spurs black ..... 1. ÆTHIOPS.
    - Tibial spurs white ..... 2. MINUTUM.
  - Legs black, anterior femora and tibiæ, and intermediate knees honey-yellow ..... 3. ORIZABÆ.
  - Legs honey-yellow, coxæ, trochanters, tips of posterior tibiæ and their tarsi black ..... 4. EXPLORATOR.
- Wings hyaline, apex fuliginous.
  - Legs entirely black ..... 5. MEXICANUM.
  - Legs black, anterior pair except base honey-yellow ..... 6. APICALE.
  - Legs black, anterior tibiæ and tarsi, base of intermediate tibiæ, their tarsi and band at base of posterior tibiæ white or yellow ..... 7. TIBIATOR.

Body black; head, pro and mesothorax and anterior legs flavo-ferruginous ..... 8. THORACICUM.

Body black; abdomen and legs flavo-ferruginous ..... 9. ABDOMINALE.

Body ferruginous; head, antennæ, metathorax and pleura black ... 10. SEMINIGRUM.

Body fulvo-ferruginous; mouth, antennæ, pleura beneath and metathorax black ..... 11. VIATOR.

Body yellow; three spots on mesothorax, spots on pleura, and abdomen, except base, black ..... 12. ORNATUM.

1. TOXONEURON ÆTHIOPS. *N. sp.*

♀.—Black, shining, clothed rather thickly with a short whitish pubescence; wings fuliginous, a sub-hyaline spot beneath base of stigma, posterior wings except tips and costa, hyaline; legs black, anterior knees bright honey-yellow, their tarsi palish. Length .25 inch.

Cordova, Mexico. (Sumichrast.)

2. TOXONEURON MINUTUM. *N. sp.*

♀.—Very small, black, shining, slightly pubescent; wings uniformly pale fuliginous, iridescent; legs black, tibial spurs white, anterior knees, their tibiæ, four anterior tarsi except tips, and intermediate knees pale yellowish. Length .10 inch.

Illinois.

3. TOXONEURON ORIZABÆ. *N. sp.*

♂.—Black, shining, slightly pubescent; mandibles, anterior femora except base, their tibiæ and intermediate knees, honey-yellow, tibial spurs black; wings fuliginous, iridescent, posterior pair sub-hyaline; abdomen flat, base tinged with piceous. Length .16 inch.

Orizaba, Mexico. (Sumichrast.)

4. TOXONEURON EXPLORATOR.

Bracon (Toxoneuron) explorator, Say, Bost. Jour. Nat. Hist., i, p. 259.

"Indiana" (Say); Illinois; Texas. The femora except base, and the tibiæ except apex of posterior pair, are bright honey-yellow; tibial spurs pale; in one specimen the posterior femora and tibiæ are dusky. Length .20 inch.

5. TOXONEURON MEXICANUM. *N. sp.*

♂ ♀.—Black, shining, rather thickly clothed with a short, white, sericeous pubescence; tips of mandibles brown; impressed lines on mesothorax and excavation at base of scutellum, crenulated; wings hyaline, apex beyond first cubital cell fuliginous, nervures black; spurs of anterior tibiæ pale. Length .25–.30 inch.

Cordova, Mexico. (Sumichrast.) Sometimes the posterior orbits are tinged with honey-yellow, and the pubescence on anterior tibiæ tinged with yellow.

6. Toxoneuron apicale. *N. sp.*

♂.—Black, shining, clothed with a very short dull pubescence; sutures of mesothorax not crenulated; metathorax with strongly developed elevated lines; wings hyaline, apex fuliginous, leaving base of marginal and of second cubital cells hyaline; nervures and stigma black; legs black, anterior femora except base and their tibiæ entirely, bright orange-yellow, intermediate knees slightly tinged with testaceous. Length .20 inch.

Illinois.

7. Toxoneuron tibiator.

Bracon tibiator, Say, Long's 2nd Exped., ii, p. 322; *(Toxoneuron)* Bost. Jour. Nat. Hist., i, p, 259.

"Pennsylvania" (Say); Illinois. A very pretty species, easily recognized by the white annulus at base of posterior tibiæ. Length .25 inch.

8. Toxoneuron thoracicum. *N. sp.*

♂ ♀.—Black, shining; head, prothorax, mesothorax, spot beneath tegulae and anterior legs except coxae, trochanters and base of femora pale ferruginous; spot on cheeks beneath, mouth, more or less of clypeus and a spot between ocelli and eyes in ♂, black; wings uniformly blackish-fuliginous, nervures and stigma black; metathorax with strongly developed elevated lines, forming an ovate central area. Length .20 inch.

Cordova, Mexico. (Sumichrast.)

9. Toxoneuron abdominale. *N. sp.*

♂.—Black, clothed with a short dull pubescence; posterior orbits, legs except coxae and trochanters, and the abdomen entirely pale sanguineous; base of first abdominal segment tinged with yellow; wings dark fuliginous, nervures and stigma black; posterior tarsi dusky. Length .28 inch.

Illinois. *Bracon populator* (Say, Long's 2nd Exped., ii, p. 323), which is also referred to this genus by Say, and which, he says, is "a very common insect in many parts of the United States, does not appear to be a *Toxoneuron*, as the ovipositor is described as being longer than the abdomen." It is probably a true *Bracon*.

10. Toxoneuron seminigrum.

Tenthredoides seminiger, Cress., Proc. Ent. Soc. Phil., iv, p. 291, ♂ ♀.

Colorado. Colored much like *Microdus divisus*, described in the preceding paper (page 52); the form is, however, much more robust, and the neuration of the wings entirely different.

11. Toxoneuron viator.

Bracon (*Toxoneuron*) *viator*, Say, Bost. Jour. Nat. Hist., i, p. 258.

"Indiana" (Say); Arizona. The specimen from Arizona has all the coxæ, except spot on two anterior pair beneath, concolorous with remainder of legs. Length .30 inch.

12. Toxoneuron ornatum. *N. sp.*

♂.—Lemon-yellow, shining; spot behind antennæ covering ocelli, extending to summit of eyes and from thence in a narrow line to occiput which it margins, three stripes on mesothorax, the central one broad and abbreviated behind, spot on scutellum, short line beneath tegulæ, furcate line on pleura, large spot on underside, posterior coxæ beneath and a spot above at base, their femora and tibiæ within, spot on each side of first abdominal segment, and the remaining segments except very narrow apical margins, black; flagellum brown; wings yellow-hyaline, apex fuscous, nervures and stigma reddish-brown; apex of abdomen compressed. Length .25 inch.

Cordova, Mexico. (Sumichrast.) A beautiful species.

Genus Proterops, Wesm.

Proterops californicus. *N. sp.*

♂,—Black; abdomen entirely ferruginous; wings uniformly blackish-fuliginous; antennæ as long as body; legs entirely black, slender. Length .30 inch.

California. (Behrens.) This is allied in general form to *Toxoneuron*, from which it is at once separated by the anterior ocellus being situated between the insertion of the antennæ. The neuration is also quite different.

SPECIFIC NOMENCLATURE.

BY H. K. MORRISON, OLD CAMBRIDGE, MASS.

The publication of Mr. Scudder's Revision has caused much dismay among amateurs, on account of the numerous specific changes and minute generic sub-divisions which it proposes.

To students of Lepidoptera the novel, and in many cases, original views advanced afford a fertile field for discussion. Mr. Scudder has attempted to study the order by the same methods, and to correct its tangled specific nomenclature by the same principles which govern all other departments of Zoology.

This work is rendered very difficult from the fact that their beauty and the readiness with which they can be captured and preserved, has made them from the time of Linnæus a favorite order with collectors. Thus it was that many of the species have been described not by naturalists, but by amateurs ; and genera founded on the most casual and unimportant characters. The confusion caused by the publication of superficial and carelessly written works, or of works in which the labors of preceding Entomologists have been neglected, it will take years to undo. Mr. Kirby, in his invaluable catalogue, has combined the results of the labors of European students in this direction, and adopted, although he did not fully carry out, the principles which Mr. Scudder followed strictly in his Revision.

Unless some definite law is laid down and universally observed, in regard to Entomological nomenclature, the Science will always remain in the chaotic condition in which it now is. Time will only increase the confusion ; and now that a good remedy has been proposed, it would be folly to reject it, because of the temporary inconvenience it would occasion. The condemnation with which Mr. Scudder's book has been received seems to be founded, not on an intelligent rejection of his deductions, but simply on account of the trouble which a partial change of names would cause the present generation of students.

But is it not better to endure a slight and constantly diminishing evil for the sake of a future and permanent good ?

There are two laws by which the nomenclature of a science may be governed, that of priority and the so-called law of convenience. The

former is fixed, immutable, and to it every possible case of generic or specific synonymy can be referred, and at once and for ever decided. The latter is relative, changeable, differing in various countries and among Entomologists of the same country. That which is convenient to European Lepidopterists is the reverse to American. A collector has a different standard of convenience from a naturalist. To reconcile all these different opinions is impossible; there is no rule which would be acknowledged by all.

Take as an example one of our common Hesperidæ, *Pamphila zabulon*, described by Boisd. & Lec. in 1833, and found in all the European collections under that name. In 1862 the same species was described in Harris, Ins. Mass., as *Hesperia hobomok*, and it is so named in most American collections. By the law of priority the matter would be at once determined in favour of *zabulon*. But which is the most convenient?—*zabulon* evidently to European Entomologists, and *hobomok* to American.

Here is a case in which the convenience of the two parties will always be opposed, and what rule have we to decide which is right? none, unless we accept priority as our guide.

Priority can be applied equally well to genera, but whether it would be advisable to change our families in accordance with it is, perhaps, doubtful, as the family name is not used in designating the insect and is therefore not of so much importance.

By accepting these laws as proposed by Mr. Scudder, we are under no obligation to follow him in his excessively fine generic divisions. It is the array of new names which gives his paper, at first sight, such a formidable appearance. I would be the last one to separate such closely allied species as *massasoit* and *zabulon*, *mystic* and *sassacus*, *polyxenes* and *troilus*, and many others which are placed in new genera.

But the questions which can be raised in regard to the expediency of using large or small genera, and others of like nature, will, in time, settle themselves, if we can establish our nomenclature on a firm foundation which will never be disturbed by subsequent investigation. This we think Mr. Scudder has done, and we hope that his work will be appreciated by American Lepidopterists.

MICRO-LEPIDOPTERA.

BY V. T. CHAMBERS, COVINGTON, KENTUCKY.

Continued from Page 50.

GRACILLARIA.

If the rule holds good absolutely that the same generic name should not be used in Entomology and Botany, then *Gracillaria* must be dropped in one or the other. I do not know which has priority, but a name of a genus so old and well known as the *Gracillaria* of Micro-Lepidopterists ought scarcely to give place to an obscure genus of *Cryptogamia*.

EIDO ALBAPALPELLA.

Venillia albapalpella, ante v. 4, p. 207.

Dr. Packard calls my attention to the fact, which has slipped my memory, that *Venillia* is preoccupied among *Geometridæ*. I therefore substitute *Eido* for it.

PSORICOPTERA GIBBOSELLA, Stainton.

Adrasteia quercifoliella, ante v. 4, p. 206.

When '*Adrasteia*' was established I knew *Psoricoptera* only by name A specimen of *A. quercifoliella* which I sent to Mr. C. V. Riley, was pronounced by him to be nothing else than *P. gibbosella*, St. Mr. Riley states that he has bred the species from larvae feeding on Oak leaves, and that he compared his bred specimens with specimens in the collection of Mr. Stainton. He has also favored me with a generic and specific diagnosis of *P. gibbosella*, and I am satisfied that his identification of *A. quercifoliella* with it is correct. *Adrasteia* must therefore give place to *Psoricoptera*, and the species which I have placed in the former must be removed to the latter genus. Some of the other species (as *e. g. D? pseud-acaciella*) which I have placed provisionally in *Depressaria*, also approach very nearly to *Psoricoptera*, if they do not in fact belong *in* it.

PTEROPHORUS.

P. lacteodactylus. N. sp.

Creamy white. Head pale lemon yellow, except between the antennae where it is of the general creamy white hue; abdomen with a streak of pale lemon yellow along the sides. *Alar ex.* 1⅛ inch. Kentucky, in June.

ADELA.

A. bella. N. sp.

Vertex, upper portion of the face, palpi and a long streak on each side of the thorax under the wings brilliant golden; lower portion of the face dark purple. ♀ with the basal half of the antennae dark purple, the remainder snowy white: in the ♂ only about the basal third is purple. Thorax above the wings and both pairs of the wings dark shining purple, the thorax and primaries with a golden gloss and appearing, according to the light, dull brown purple, violaceous, or golden; before the apex of the primaries are three narrow, and in some lights, indistinct fasciae, the color of which varies with the light and all of which are faintly dark margined both internally and externally; the third fascia is at the apex. The fasciae when most distinct have a silvery lustre.

Al. ex., ♂ ½ inch; ♀ a little larger. Kentucky.

A fresh or living specimen of this insect is a gorgeous creature, but after death the colors become dull. I am not acquainted with the larva. The imago may be taken in May, feeding upon the flowers of the "Climbing Bittersweet" (*Celastrus scandens*), and a little later it is not uncommon resting upon leaves along paths or roadways through the woods.

DICTE, *gen. nov.*

Head, face as broad as the thorax; head and face, basal joint of the antennae and first and second joints of the labial palpi clothed with long loose hair-like scales; antennae with the basal joint incrassate, stalk simple, reaching to the apex of the wings; maxillary palpi microscopic; labial palpi drooping (in the dead insect), the terminal joint projecting forwards and a little upward, and about two-thirds as long as the second joint. (If recurved the palpi would reach the vertex.) Tongue naked, rather longer than the thorax; eyes globose, prominent.

Wings deflexed; anterior oblong ovate, obtusely pointed, with moderately long ciliae. The costal vein attains the margin about the middle. The subcostal curves gradually into the discal, giving off a long branch before the middle, a shorter one behind the middle, then a furcate one which curves upwards to the costal margin, whilst the apical branch also curves up from its junction with the discal vein to the margin just before the apex; the discal vein closes the discal cell and sends three branches to the posterior margin; the median is straight to the discal, where it becomes furcate, both branches attaining the posterior margin; submedian simple.

Posterior wing about as wide as the anterior, sub-ovate, the apex pointed and the costal margin but slightly convex; the costal attains the margin behind the middle; the discal cell is closed by a much curved discal vein which emits two branches to the posterior margin; the subcostal sends a branch to the apex from near the end of the cell and beyond the discal vein becomes furcate, both branches attaining the margin behind the apex. Median and submedian both simple, and both attain the posterior margin.

The roughened head and palpi and the shape and neuration of the wings ally this genus to *Tenea* and its congeners.

D. corruscifasciella. N. sp.

Head, palpi, basal joint of the antennae, thorax and basal half of the anterior wings golden yellow; antennae glistening snowy white, the apical half annulate with velvetty black; just before the middle of the anterior wing, in the yellowish portion, is a brilliant metallic fascia. The central portion of the apical part of the wing is occupied by a large, nearly circular, greyish drab spot, containing four longitudinal velvetty black streaks, bordered before by a brilliant metallic costal streak which points towards the fascia; and behind by a similar costal streak pointing towards the dorso-apical margin. The grayish drab spot is separated from the dorsal margin by a rather large triangular velvetty black patch, the apex of which touches the dorso-apical margin. This triangular streak is dusted a little with grayish drab scales; two metallic spots on the disc, and four dorsal spots of the same hue. Costo-apical margin and the apex brownish golden, with a bright metallic fascia interrupted in the middle, and another streak of the same hue at the extreme apex. Posterior wings purplish fuscous; under surface of both wings purplish fuscous mixed with yellowish green, and the fascia and streaks of the forewing visible through the wing. Abdomen black washed with golden, and each segment margined beneath with silvery; legs black, annulate with white. *Alar ex.* a little over ½ an inch.

Kentucky and No. 127, collection of Mr. Wm. Saunders, London, Ont. Rare. This is one of the prettiest and most brilliant 'Micros' known to me.

SOLENOBIA.

S. Walshella? Clem. *Proc. Ent. Soc. Phila., vi, p. 132.*

Dr. Clemens described this species from a single specimen sent to him by the late Mr. Walsh. Mr. Walsh took the larva in the winter time

underneath the bark of Hickory trees, and suspected it of making galleries under the bark. Dr. Clemens more correctly suspected that it was lichenivorous and hoped that Mr. Walsh might ascertain its larval history. Alas! the researches of both have terminated forever.

Only the male was known to Dr. Clemens, and from his description I think his specimen must have been somewhat rubbed. Male, "Head and face dark gray. Antennae dark gray, slightly spotted with white." Fore wings dark gray at the base, remainder paler, sprinkled irregularly with dark spots and scales. Ciliae grayish white. "Hind wings gray." (The quotations are from Dr. Clemens' description.) The female is apterous, with the head clothed with hoary scales and a tuft of the same at the apex; but the body is nearly naked. *Al. ex.* $\frac{5}{8}$ inch. Kentucky. Common.

The larva feeds upon lichens and may be found in March and April, feeding up. It becomes a pupa in April and the imago emerges about a week thereafter. The larva is whitish, head black, upper surface of the two succeeding segments shining yellowish brown, anteriorly margined with white. The case is prismatic in outline, and of an almost leathery consistence, about $\frac{1}{3}$ of an inch long, and tapering slightly towards each end; it is composed of silk, sand, particles of lichens, and excrement of the larva, and I have sometimes found small Molluscous shells adhering to it.

ON SOME OF OUR COMMON INSECTS.

IV.—*THE ISABELLA TIGER MOTH.*

Pyrrharctia (Spilosoma) Isabella.

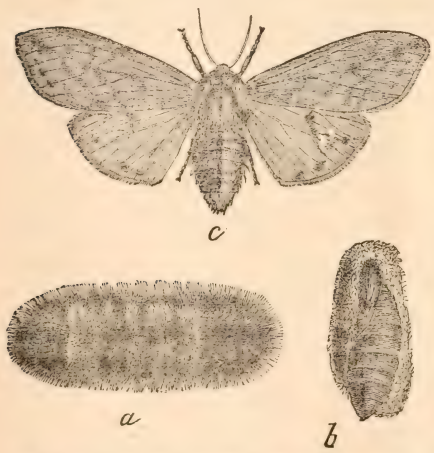
BY W. SAUNDERS, LONDON, ONTARIO.

There are but few of our readers who are not familiar with the caterpillar of the Isabella Tiger Moth, one of our commonest "woolly bears," and found, we believe, in almost every part of Canada and the Northern United States. This larva, in common with many other members of the family *(arctiadæ)* to which it belongs, hybernates during the winter. It acquires nearly full growth in the autumn, and then, having selected a cosy sheltered spot under bark, log, rail, stone or board in which to hide, it

coils itself up there into a sort of ball and sleeps through the long and dreary winter, and about the time when the birds come back and the warm days of spring begin, this bristly creature rouses itself to begin life anew. Hence it is one of the few caterpillars which present themselves to us full grown in early spring, and from its peculiar appearance can scarcely fail to attract attention. It has not to wander far for food, for, being in possession of an omnivorous appetite, it feasts on the first green thing it meets with, grass, or weed, or early plant, and having fed but a short time, it spins its cocoon and becomes a chrysalis.

The caterpillar is about an inch and a quarter long; its head and body are black, and it is thickly covered with tufts of short, stiff, bristly hairs, which are dull red along the middle of the body and black at each end. When handled it immediately coils itself into a ball and remains for some time motionless. It is very tenacious of life; we have known the larva to be frozen in a solid lump of ice, and when thawed out move around as if nothing had happened. It sometimes occurs, although very rarely, that this larva becomes a chrysalis early in the fall, and produces the moth the same season. We have never met with an instance of this but once, see CAN. ENT., vol. i, p. 26; its usual course is that which has already been partially described.

Fig. 14.



Its cocoon, *b*, fig. 14, is spun in some secluded nook, and is of a dark color, of an elongated oval form and curiously wrought with a network of silk, in the meshes of which are interwoven the black and red hairs from the body of the caterpillar. Within this enclosure the insect changes to a dark brown chrysalis, and remains as such about two or three weeks, sometimes longer, when the moth having burst its shelly covering, softens the silky fibres of which its cocoon is formed by a liquid with which it is furnished, and makes its exit through a hole at one end of the cocoon.

The moth, *a*, fig. 14, when its wings are spread, measures about two inches. Its wings are of a pale yellowish buff colour, with a few dull

blackish dots more numerous on some specimens than on others. The hind wings are sometimes paler than the fore wings, and at other times tinged with orange red, while in other specimens we have observed that the under surface of the fore wings assumed a dull rosy hue. The body is a little deeper and richer in colour than the wings, and the abdomen is ornamented with longitudinal rows of black dots; on the upper surface there is a row down the middle of the back, and one on each side, and on the under surface there are sometimes two additional rows of smaller dots.

Although this insect is so common and well known in its larval condition, it is not often seen on the wing. It flies at night, and being seldom attracted by lights, it rarely finds its way into our houses. It is also probably subject to the attacks of ichneumons, which destroy some of the caterpillars before they reach maturity.

ON THE GEOGRAPHICAL DISTRIBUTION OF SOME GENERA OF CANADIAN INSECTS.

BY FRANCIS WALKER, LONDON, ENGLAND.

Before leaving the Canadian *Chalcidiæ*, in hope of returning to them when many more genera are discovered in Canada, I will mention *Megastigmus*, which very probably occurs there; it is a genus of *Torymidæ*, and, in some respects, connects that family with the *Eurytomidæ*, and is next to the latter in the interest with which it may be regarded in case there is a foundation for the report lately published concerning the seed-eating habits of the species which represent it in California. But this does not seem probable, as it is certainly carnivorous in Europe, where two species exceed the others in beauty and are especially conspicuous, the great *M. giganteus* that maintains itself on the *Cynips* of a one-chambered gall in the Mediterranean region, and *M. dorsalis* that, with various other species, lives on the substance of the *Cynips* of the many-chambered Oak Apple of North Europe. I have seen other species near London and in the Alpine vallies of Switzerland, and they are attractive on account of their comparative rarity, though their economy is but little known. The natural history of the Australian species may be unknown for some time to come, and I hope that its discovery will be preceded by attention to the Canadian galls and to their parasitic inhabitants.

SIREX.—This genus is well known by the large size of the few species that have been discovered and by its especial habitation in the North. I have mentioned elsewhere its occurrence in Eastern Siberia, which may have been the earlier habitation of the European species, and wherein some of the North American species also dwell, such as *S. gigas*, *S. albicornis*, *S. juveneus*, *S. spectrum* and *S. flavicornis*. *S. juveneus* has appeared as far south as Algeria, and *S. cedrorum* is contemporaneous with the cedars on Mt. Lebanon. *S. varipes* and *S. dimidiatus* inhabit North America, and there are three apparently undescribed species from that region and one of small size from Mexico. There are two in North Hindostan and one in Australia, and three or four whose native country is unknown to me. It does not appear that distance in space between two species is accompanied by corresponding difference in character, for the Australian species is very nearly allied to *S. juveneus*. In the neighbouring genus, *Tremex*, the European *T. juxicernis* is represented in North America by *T. columba*, and there are three undescribed species, one of North America, one of Hindostan, and one of China.

NOTES ON COLLECTING.

BY THEODORE L. MEAD, NEW YORK.

Last season, while in the Catskill Mountains, I made some experiments in sugaring for moths, which may be interesting to collectors.

The sugaring mixture employed was "molasses sugar" and water, in the proportion of three or four pounds to the gallon; I could not perceive that other additions, such as alcohol or preserved fruit, &c., were of any advantage.

About twenty trees in an orchard were sugared, but very few moths were seen for the first night or two, though as afterwards they came in immense numbers, it would seem that a little time is required for the news to spread.

Having found a cyanide poison-bottle to be very useful in killing small Diurnals, and noticing the almost universal habit of these moths, when disturbed, of darting downward before flying away, it occurred to me to make a poison-bottle on a large scale and to dispense with a net, always so inconvenient to use at night.

Accordingly I procured a quart bottle with as wide a mouth as possible—a fruit jar would have done very well—put in it enough lumps of common fused cyanide of potassium to cover the bottom, and having poured upon this about an inch of plaster of Paris mixed with plenty of water, I had only to await nightfall to commence operations.

The large poison-bottle worked to a charm; scarcely a moth escaped which I desired to take. With the new instrument I became impatient of the time required to take out and pin each specimen as soon as stupefied, and tried the experiment of capturing every uninjured moth seen and allowing them to remain in a layer upon the plaster until it was convenient to return to the house and sort them over, taking a moderate amount of care that they should not be unnecessarily shaken up in carrying.

Rather unexpectedly I found that this treatment did not seem to injure or rub the specimens in the least degree, though sometimes nearly a hundred moths of all sorts and sizes would be piled together, making a stratum an inch or two thick in the bottle.

After this discovery night collecting became easy, nets and boxes were left at home, and the only necessary articles were a lantern and the poison-bottle. Arrived at a tree and carefully turning the light upon the sugared patch, I selected out such moths as seemed desirable, and, removing the stopper, gently touched them from below with the open bottle. When they had flown down into the receptacle, the cork was replaced and the specimens were thus safely disposed of till the following morning, when they could be sorted over at leisure.

Occasionally a very wary moth would fly away at the first approach of artificial light, and I endeavored with laudanum and hydrate of chloral to so stupefy them that they could be readily taken. The laudanum was rather too effective, seeming to intoxicate them; at any rate, after imbibing the mixture, the moths fell off the tree and sprawled around in the grass in a very absurd manner, quite unable to fly away; but still most of them managed to go a considerable distance, and so were lost in the grass. The hydrate of chloral had no effect whatever upon them; some moths which took a considerable quantity of a very concentrated solution—about equal bulks of the salt and of water—remained unaffected.

Sometimes ants were troublesome, biting the trunks of the moths as they fed, and causing them to fly away. In these cases a dose of laudanum was generally effective in driving off the ants for a considerable time.

Strips of white cloth nailed upon the trees were very convenient to receive the sugar, though not necessary. One afternoon, while preparing my baits for evening, a fine *Grapta Interrogationis* hovered around the tree for a moment and then lit close by, and unrolling its proboscis, feasted on the nectar. While engaged in this absorbing operation I readily captured it between thumb and finger. In some localities where rare species are to be found, it may be worth while to try sugaring for butterflies as well as moths.

The vapor of hydrocyanic acid in the poison-bottle, as a rule, did not change the colors of specimens even after prolonged exposure. But a single moth of those collected, a pinkish *Crambus*, was faded by it, changing to olive brown.

At my suggestion cyanide of potassium was adopted by the American Museum of Natural History, to preserve their Entomological collections from the ravages of insects. At first small tin boxes were used, but the salt chrystallized upon the tin and made its way over the edge and down the sides of the receptacle, staining the cabinet drawers. Finally small glass capsules were used to contain the poison, and proved satisfactory. The vapors render it unpleasant to work over the drawers while the capsules are in them, but with the temporary removal of these the inconvenience ceases. A fly or other small insect introduced into one of the cases, dies in a very short time, and the protection against Dermestes is very complete, though of course it is hardly advisable to use this method where the drawers are not nearly air-tight. Still I think that every Entomologist would find a single tight receptacle thus poisoned very useful as a sort of quarantine for suspected specimens. Even delicate green *Geometrae*, after being in an atmosphere of prussic acid vapor for months, have, so far, shown no change in color.

The South London Entomological Society, which, though only nine months old, has been extremely successful, held on Thursday evening last, at Dunn's Institute, Newington Causeway, a very interesting exhibition of collections of insects, chiefly British Lepidoptera. The collections were made by the members themselves, all amateurs, and do them the greatest credit. The room was densely crowded, and the exhibition was a great success.

The Canadian Entomologist.

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HYPENA SCABRA (FABR.) AND H. ERECTALIS, GUEN.

BY J. A. LINTNER, ALBANY, N. Y.

In the examination of my last season's collections of *Hypena scabra* (scabralis, Guen.,) and "*H. erectalis*," for sexual determinations, I was surprised to find of the former, only the male represented, and of the latter, only the female. Collections of each having been made during the same period of time (from September 1st to September 24th) and at the same place (the wall and ceiling of the piazza of my residence)—such a remarkable occurrence seemed to be so removed from accident, and inexplicable from any difference of sexual habits, that I was led to suspect the identity of the two species. On referring to my cabinet, I there found individuals labelled as ♂ and ♀ of each species; but, on a critical review of these determinations by an infallible method of distinguishing sex in the Heterocera, viz., the structure of the *frenulum* (simple in the male and compound in the female), my "♀" *scabra* proved to be a ♂, and my "♂" *erectalis* a ♀. Among my duplicates of the collections of several years, the same result obtained. Mentioning these facts to my friend, Mr. Meske, of this city, he was quite positive of having in his cabinet the sexes of each species, but he subsequently found that a frenulum inspection of all his examples gave him only one sex of each form. There was, therefore, no longer room for doubt of the identity of the "two species"—that "*erectalis*" is only the female (though uniformly smaller) of *scabra*.

It is interesting, in connection with the above, to notice that Guenee, in his description of *scabralis*, refers to seven ♂'s under his observation, and says, "Je ne connais pas la ♀." Of *erectalis* he says, "3 ♂, 1 ♀." Mr. Grote (Trans. Amer. Ent. Soc., iv, p. 102) cites ♂ and ♀ of *erectalis*

and *scabra*. The varying form of the abdomen of *scabra*—each sex often assuming the form pertaining to the other—may have easily led him into this error,as it had done with me in those which I had placed in my cabinet.

A strong testimony to the value of the investigations in which the eminent German Lepidopterist, Dr. Speyer, is at present engaged, in his examination and comparison of the identical or closely allied forms of European and American Heterocera, is given in the fact, that from the study of a small number of *scabra* and *erectalis* submitted to him (perhaps three of each form), he was led to believe that the two would prove to be but one species. This opinion was recently communicated by him in a letter to Mr. Meske. Before its reception, the conclusion, confirming his belief, to which I had arrived, through an examination of abundant material, had been forwarded to him.

There seems to be no sufficient reason at present for changing the *scabra* of Fabr. into the *scabralis* of Guenee—the true relations of the Deltoidæ, whether to the Noctuas or to the Pyralites, being still a matter of opinion and discussion.

I embrace the present opportunity to communicate the fact, that an example of *Depressaria Ontariella* Bethune, sent by me last fall to Dr. Speyer, and by him submitted to Zeller, was by the latter determined to be *D. heracliana* Deg. The opinion of Mr. Angus, recorded in vol. 2, p. 19 of this Journal, that it was probably identical with the above named European species, is hereby confirmed.

DESCRIPTIONS OF NORTH AMERICAN HYMENOPTERA, No. 7

BY E. T. CRESSON, PHILADELPHIA, PENN.

Continued from Page 54.

Genus HELCON, Nees.

Posterior femora toothed beneath near apex.
- Body entirely black, legs ferruginous.....1. OCCIDENTALIS.
- Body black and ferruginous.
  - Abdomen black, with broad median ferruginous band...2. BOREALIS.
  - Abdomen entirely ferruginous.
    - Metathorax and pleura more or less ferruginous; posterior tarsi white.....3. ALBITARSIS.
    - Metathorax and pleura black; posterior tarsi black.4. FRIGIDUS.

Posterior femora simple.
Body entirely black.
Legs entirely honey-yellow or ferruginous.
Wings hyaline; first abdominal segment narrow, shining .....5. AMERICANUS.
Wings fuliginous; first abdominal segment broad, opaque.....6. FULVIPES.
Legs ferruginous, posterior femora, tibiæ and tarsi black.7. PEDALIS.

1. HELCON OCCIDENTALIS.

Helcon occidentalis, Cress., Proc. Ent. Soc., iv, p. 292. ♀.

Colorado.

2. HELCON BOREALIS. *N. sp.*

♂.—Black, opaque; clothed with a short thin pale pubescence; top of head, cheeks and space on side of pleura smooth and shining, face finely and densely punctured; antennæ long, slender, brown; thorax densely, rather roughly sculptured, somewhat coriaceous; metathorax densely and coarsely sculptured; tegulæ dull honey-yellow; wings hyaline, iridescent, nervures and stigma fuscous; legs bright honey-yellow, anterior coxæ tinged with fuscous, posterior tibiæ black, reddish at base, their tarsi pale yellow, dusky at tips, femoral tooth strong and blunt; abdomen depressed, first segment coriaceous, second and third segments honey-yellow. Length .33 inch.

Maine.

3. HELCON ALBITARSIS. *N. sp.*

♂.—Head, pro and mesothorax, scutellum and sometimes the pleura entirely black; remainder honey-yellow or ferruginous; sometimes the pleura is entirely ferruginous, and sometimes the metathorax is obscurely ferruginous, nearly brown; antennæ black or brown; head and thorax sculptured as in *borealis*, the metathorax being more distinctly reticulated; tegulæ honey-yellow; wings hyaline, iridescent, nervures and stigma fuscous; legs bright honey-yellow, posterior tibiæ black, reddish at base, all the tarsi white, dusky at tips, femoral tooth acute; abdomen narrow, shining, first and second segments reticulated; apical segments sometimes tinged with dusky. Length .27–.35 inch.

Virginia; Illinois. This may be the male of *dentipes*, Brulle, the female of which is described as having a white annulus on antennæ, and the tarsi are not conspicuously white as in *albitarsis*.

4. Helcon frigidus. *N. sp.*

♀.—Black, shining; face rough; antennæ slender, black; prothorax except posterior angles, semi-circular band on pleura, disk of mesothorax and basal excavation of scutellum, covered with coarse striæ or reticulations; metathorax coarsely reticulated; tegulæ piceous; wings smoky hyaline, nervures and stigma black; legs, including coxæ, rufo-ferruginous, tarsi tinged with yellowish, posterior tibiæ blackish, femoral tooth strong and very blunt; abdomen longer than thorax, narrow, polished, ferruginous, dusky at base, first segment with two longitudinal ridges and a stout blunt tubercle on each side near base; ovipositor longer than body, honey-yellow, sheaths black. Length .45–.50 inch.

Hudson's Bay; Vancouvers' Island (Henry Edwards.)

5. Helcon americanus. *N. sp.*

♀.—Black, shining; face roughened; prothorax and metathorax reticulated; labrum and mandibles except tips ferruginous; palpi pale yellowish; antennae long and slender, brown-black, base honey-yellow; middle lobe of mesothorax prominent, divided from the side lobes by a deep groove which become confluent behind; tegulae and base of wings honey-yellow; wings hyaline, sub-iridescent, nervures and stigma black; legs honey-yellow, posterior tibiae and tarsi more or less dusky, femora simple; abdomen long, slender, shining, sides and base of second and third segments tinged more or less with testaceous, first segment long, narrow, grooved medially; venter more or less tinged with testaceous; ovipositor very long and slender. Length .55–.60 inch.

Canada; Virginia. Very distinct from *fulvipes* by the shape and sculpture of the first abdominal segment.

6. Helcon fulvipes.

Helcon fulvipes, Cress., Proc. Ent. Soc. Phil., iv, p. 292. ♀.

Colorado.

7. HELCON PEDALIS. *N. sp.*

♂ ♀.—Same form and sculpture as *fulvipes*, from which it differs by the posterior femora except base, and their tibiae and tarsi being black. Length .40–.48 inch.

Hudson's Bay; Massachusetts.

MICRO-LEPIDOPTERA.

BY V. T. CHAMBERS, COVINGTON, KENTUCKY.

Continued from Page 50.

TINEA.

1. *T. cunitariœella. N. sp.*

Black; head and face rufous; palpi grayish white; antennae yellowish gray, annulate with black, tips white; wings black, with a costal and dorsal white spot opposite each other just before the middle (sometimes united, forming a fascia), a white fascia (sometimes interrupted) beyond the middle, a costal white spot in the apical portion of the wing, and near the apex an obliquely curved costal white streak; apical portion of the wing bronzy, iridescent, ciliae grayish brown; legs silvery white, in parts tinged with fuscous; posterior wing fuscous. *Alar ex.* less than ⅓ of an inch.

The larva is found upon old stone walls and monuments in cemeteries. I do not know whether it feeds upen the hairs contained in the mortar of the walls or upon the mortar itself, or upon Lichens, but upon the wall where I have found it most abundantly, I have never found a trace of Lichens. The case is composed of silk and grains of lime. It is flattened, with the under surface truncate at each end, and the upper surface projects in shape something like the bowl of a spoon at each end; the sides are emarginate near each end. I have lost my notes upon the larva. *Hab.* Kentucky and the Gulf States.

It is one of the handsomest *Tineæ* known to me.

2. *T. Orleanscella. N. sp.*

Straw color or pale yellowish, thickly dusted with fuscous; a discal fuscous spot about the middle of the wing, and another opposite to it on

the dorsal margin; a row of dark brown spots around the apex, a dark brown spot on the base of the costa and an obscure one at the inner angle: the apical portion of the wing is thickly dusted. Antennae grayish stramineous: head and palpi sordid stramineous, the outer surface of the palpi brown. *Alar ex.* ⅜ inch. New Orleans, La., in November.

3. T. auristrigella. N. sp.

Head and antennae straw color or pale golden, palpi silvery; thorax and wings brown in some lights, bright purple, roseate or violaceous, with a wide shining straw colored or pale golden streak upon the fold, beginning at the base of the costa and extending to and into the beginning of the dorsal ciliae, and sometimes connected with a large straw colored or pale golden costal spot before the costal ciliae; ciliae pale golden *Alar ex.* ⅜ inch. Kentucky, in July.

4. T. straminiella. N. sp.

Head sordid yellowish; palpi, antennae, thorax and anterior wings straw color, palpi brownish externally; sides of the thorax behind the eyes brown; a row of small brown spots along the fold, another at the end of the disk. Apex dusted with brown. *Alar ex.* ⅓ inch. Kentucky, in June.

5. T. iridella. N. sp.

Palpi and lower part of the face brownish; upper portion and vertex yellowish; antennae brown; thorax and anterior wings iridescent, in some lights brown, in others glittering bluish green, violet or topaz red. In some lights the entire wing appears of a beautiful azure. Posterior wings pale fuscous. *Alar ex.* ½ inch. Col. Mr. Wm. Saunders, of London, Ontario, Canada.

A beautiful insect under the microscope.

6. T. misceella. N. sp.

Head and palpi pale yellowish; antennae pale fuscous; thorax and primaries fuscous and saffron yellow intermixed in almost equal quantities, the fuscous scales being sometimes aggregated into small spots, one of which is about the end of the disc and a larger one is near the base. *Alar ex.* ⅜ inch. Kentucky.

7. costotristrigella. N. sp.

Head and palpi pale saffron yellow, the outer surface of the palpi dark brown; antennae dark brown; thorax and basal portion of the dorsal margin of the primaries dark brown dusted with yellowish white, the primaries otherwise white dusted with dark brown, with an oblique dark costal streak near the base, extended to the fold; just before the middle is another longer one also extended to the fold where it enlarges into an irregular spot, being also dusted with yellowish white above the fold; just behind the middle is another streak not reaching the fold, behind which is a small costal brown spot and a row of brown spots around the apex. The apical portion of the wing is more densely dusted than the disc. Ciliae white with fuscous spots. *Alar ex.* ½ inch. Kentucky, in August and September. Taken flying.

8. T. bimaculella. N. sp.

Outer surface of the second joint of the labial palpi brown; inner surface and terminal joint pale yellowish or stramineous; head pale stramineous; antennae pale yellowish tinged with fuscous; thorax shining dark brown, almost black, except the tip which is stramineous; costal half of the primaries fuscous, narrow towards the base, but spreading towards the apex, where it is mixed with pale yellowish, with a distinct dark brown spot beyond the end of the disc; dorsal half stramineous, widest at the base, narrowing towards the apex, with a distinct dark brown spot within the margin about the middle: ciliae fuscous and stramineous mixed; anterior and intermediate legs dark brown, the tarsi faintly annulate with stramineous; posterior legs stramineous. *Alar ex.* ⅓ inch. Kentucky.

9. T. aurosuffusella. N. sp.

Palpi pale stramineous, the outer surface of the second joint of the labial pair brown; antennae pale fuscous; head and thorax pale stramineous, with a small pale fuscous spot on the thorax before the apex; primaries pale stramineous streaked along the fold with pale reddish golden, and the apical portion of the wing suffused with the same hue; a rather wide pale fuscous streak, the basal portion of which is scalloped towards the fold, extends from the base of the costa along the costal margin to a little beyond the middle, and a similar streak, scalloped towards the fold in its posterior half, extends along the dorsal margin from near the base to the

beginning of the ciliae; and at the beginning of the costal ciliae is a rather wide somewhat oblique streak or band which extends almost to the dorsal margin and is a little convex towards the base; ciliae pale stramineous. *Alar ex.* $\frac{7}{16}$ inch. Kentucky.

10. T. griseella. N. sp.

Palpi brown; head and antennae sordid yellowish gray; thorax and primaries brownish gray, with a small brownish spot within the dorsal margin before the middle, another still more faint on the disc, and a more distinct one at the end of the disc. *Alar ex.* $\frac{5}{16}$ inch. Kentucky.

11. T. marginistrigella. N. sp.

Palpi yellowish white, the labial pair brown externally and tipped with white; head whitish yellow; thorax dark brown with a faint golden tinge; primaries dark golden brown, with some white intermixed, especially in the basal portion and along the dorsal margin to beyond the middle; the white of that part of the dorsal margin is arranged in numerous narrow short streaks which are perpendicular to the margin; a large white patch at the beginning of the dorsal ciliae, sparsely dusted with brown; a row of white spots extends along the entire costal margin from near the base; two of these spots about the middle being much larger than the others; extending to the middle of the wing, and only separated from each other by a narrow crooked brown line. The margin just before and at the apex is white, much dusted with brown and separated from the dorsal white patch by a patch of brown. Ciliae white with about seven or eight brown spots extending into them. *Alar ex.* ½ inch. Kentucky.

12. T. trimaculella. N. sp.

Pale stramineous, the head a shade deeper yellow; thorax and primaries dusted with pale fuscous; two small fuscous spots upon the disc about the middle, the one nearest the costal margin being the most indistinct, and a third one more distinct at the end of the disc; posterior wings shining pale or whitish yellow. *Alar ex.* $\frac{7}{16}$ inch. Kentucky.

13. T. fuscomaculella. N. sp.

Gray, flecked and spotted with fuscous, which in some lights appears reddish or brownish golden; one of the spots is at the base of the costa, and opposite to it on the dorsal margin is a smaller one connected with it

by scattered fuscous scales ; a fuscous streak from the costa to the fold sometimes almost interrupted in the middle ; an oblique fuscous streak about the apical third of the wing and a small dorsal spot opposite to it, and another small spot of the same hue near the apex ; antennae silvery gray ; face and palpi whitish, outer surface of the palpi dusted with fuscous. *Alar ex.* ½ inch. Kentucky.

The antennae in this species and in the one next described are rather longer than is usual in *Tinea*. The neuration of the wings in both these species is also different. But I have not thought it necessary to make a new genus for them upon this account, the more especially as the neuration is by no means constant among the different species of *Tinea*, and these two species differ somewhat from each other in neuration. There are also minute differences in the form and relative size of the joints of the labial palpi between the preceding species and these two. This species and the next differ from the others and agree with each other in having the costal margin of the hind wings excised from the middle to the tip. For these reasons I had at first intended to place them in a separate subgenus, but as they differ from each other somewhat, especially in neuration and pattern of coloration, and agree with *Tinea* otherwise than as above quoted, I have concluded not to remove them from this genus. The next described species has the scales of the thorax and wings appressed and smoother than in the other species.

14. T. argenti-strigella. N. sp.

Face and palpi silvery white, outer surface of the labial palpi brown ; antennae silvery beneath, maroon brown above, annulate with silvery white ; vertex maroon brown ; thorax above, a spot under each wing and the basal portion of the primaries rich maroon brown, or in some lights violaceous, with a narrow irregular white fascia upon the wings behind the maroon basal portion ; behind the fascia the primaries are maroon brown or violaceous, mixed with white towards the fascia, the white gradually disappearing towards the apex. Six oblique silvery costal streaks, the first being small and the others becoming gradually larger to the fifth, the sixth again being smaller ; two distinct dorso-apical white streaks and a small patch of maroon dusted with white in the dorso-apical part of the wing, which is continuous with those of the five dorsal silvery streaks ; dorsal ciliae silvery ; abdomen violaceous, each segment silver fringed ; legs silvery iridescent. *Alar ex.* ½ inch. Kentucky.

A very handsome species.

The following species differ from the true *Tinea* as follows: the antennae are shorter and thicker, with the joints shorter and arranged like a series of cups placed in each other, and microscopically ciliated (or rather pubescent.) I have not thought it necessary to erect a new genus however, as in other respects they agree with the true *Tinea*.

15. T. auropulvella. N. sp.

Snowy white; outer surface of the second joint of the labial palpi brown; antennae yellowish white; primaries very sparsely dusted with pale reddish or brownish golden, except in the apical portion, where the dusting is rather dense; it is also thicker near the base of the dorsal margin. A dark brown spot on the costa at the extreme base; another larger one on the costa near the base; a smaller costal one just before the middle; a large one just behind the middle reaching to the fold; another small one before the ciliae and five or six other small ones extending around the apex at the beginning of the ciliae; in some lights these spots are distinctly golden brown. *Alar ex.* $\frac{7}{16}$ inch. Kentucky. Taken in July resting upon the trunks of trees in forests. It is rather sluggish and does not easily take flight.

16. T. fuscopulvella. N. sp.

Snowy white; outer surface of the labial palpi dark brown; antennae sordid yellowish white; thorax and primaries dusted irregularly with dark brown scales, the dusting sparse in some portions, but in others aggregated into small spots or patches, a small one of which is on the fold not far from the base; two other larger ones about the middle and others in the apical half of the wing; it also assumes the form of more or less distinct costal and dorsal streaks. *Alar ex.* $\frac{3}{8}$ inch. Kentucky.

17. T. maculabella. N. sp.

Snowy white; maxillary and labial palpi brown, except the inner surface of the labial pair, which is white; antennae sordid yellowish white; thorax and primaries snowy white, with large distinct dark brown spots which in some lights are golden brown; one of these spots is on the anterior margin of the thorax and one on each side before the apex; primaries sparsely dusted with dark brown; a dark brown costal spot at the extreme base and a larger one near the base; another within the one last named on the fold; before the middle is an oblique irregular streak

of the same hue reaching to the fold and pointing towards a spot of the same hue just within the fold; a small spot of the same hue about the middle of the costa, behind which is an irregular costal streak of the same hue which extends to the middle of the apical portion of the wing and widens into a large irregular spot; in the apical part of the wing is an indistinct *longitudinal* dorsal streak, nearly opposite to which, but a little behind it, is a larger and more distinct streak which is also longitudinal. All of these spots are mixed with or margined by reddish yellow scales; ciliae white dusted with dark brown. *Alar ex.* 7/8 inch. Kentucky.

The three foregoing species thus resemble each other and differ from the others in ornamentation as well as in the structure of the antennae. They were all three taken in the same situations.

ON THE HABITS OF CERTAIN GALL INSECTS OF THE GENUS CYNIPS.

BY H. F. BASSETT, WATERBURY, CONN.

For ten years past I have been studying the habits of the Cynipidæ to determine, if possible, whether there are one or two broods of these insects each year.

Several years ago I discovered the flies of *C. q. operator* in the act of ovipositing in the young acorns of *Quercus ilicifolia*, the oak on which the woolly galls of this species are generally found. The insect thrust its ovipositor down between the acorn and the acorn cup, and, late in the summer, the acorns thus stung proved abortive, while around them and often protruding far above the cup were little acorn-like galls, each containing a large Cynipideous larva. Several of these galls were often found in each acorn cup. That year nearly all the acorns were affected, and there are more or less thus injured every year.

I have as yet failed to rear any flies from these galls, probably because I have failed to keep the galls in the proper condition for developement.

A later discovery, made three or four years ago, was that of two, and I think three species of Cynips in the act of ovipositing in the buds of the oak, *Q. alba*, just as the buds began to develope, but before the leaves were visible.

The relationship of these species to any known species was only inferentially established. It is true that the leaves of several oaks on which I found one species very abundant, were almost all covered with galls of *C. q. futilis*, *O. S.*, but the females of this species were not so large as my new bud stinging species.

I have, for the past three years, carefully examined the buds of *Q. ilicifolia*, hoping to find the producer of *C. q. operator* at work, but without success, till this week, when I found no less than thirty gall flies ovipositing in the buds of this oak.

That they really are the producers of these galls needs no further proof than I now give. The insect *C. q. operator* is distinguished from all our other species by the projection of the ovipositor above the dorsum. In this respect it resembles the several species of guest gall flies that infest almost all our species of galls. It has, however, the neuration of the true gall flies. In size my insects are considerably larger than *C. q. operator*, but in form, color, neuration of the wings, and, above all, in the peculiar form and position of the sheath of the ovipositor, they are like this species.

Few will doubt their identity; but to make "assurance doubly sure," I hope some one will be so fortunate as to raise gall flies from these acorn galls, when a comparison with mine will settle the question whether this particular species *(C. q. operator)* is double brooded or not.

I wish (if my article is not already too long) to state a few other facts and to show their bearing upon the history of these interesting insects.

There stands not far from my house a small oak tree, *Q. bicolor*, which is almost ruined by the ravages of a species of gall fly, which closely resembles and may be identical with *C. q. botatus*, Bassett. Every summer the leaves of this tree are so injured by the galls that scarcely one perfect one can be found on the tree. The petioles and midveins are enlarged to the size of one's finger, and the blade shrivels up or remains undeveloped, and each gall contains a large number of insects which come out in June. I have reared many thousands of these gall flies and find them of both sexes—about equally divided.

Late in the summer another form of gall appears, this time on the ends of the small branches, and the insects remain in these, in the imago, through the winter. I have reared not less than fifteen thousand of these gall flies and *all are females*, and they cannot be distinguished from the

summer brood except that they are a very little larger. The flies of *C. q. futilis*, O. S., are of both sexes, but among the considerable number found ovipositing in the buds of the White Oak, and which, I have no doubt, produce the galls of *C. q. futilis*, there are no males and the females are considerably larger than the summer brood.

And again, in my last discovery the flies are all females, but larger than the females of *C. q. operator*, though they have the structural peculiarities of that species.

From all the above facts I infer that all our species that are found only in the female sex are represented in another generation by both sexes, and that the two broods are, owing to seasonal differences, produced from galls that are entirely distinct from each other. I shall not be surprised if it shall yet be found that all our species of Cynips proper are double brooded, but the allied genera *Diastrophus* and *Rhodites* probably produce but one brood each year.

Mr. Walsh's successful attempts at colonizing *C. q. spongifica*, O. S., do not prove that the galls he raised were the *immediate* product of the flies he colonized ; another generation may have intervened from which his galls were descended. I have in mind two species of Cynips that mature from the egg in less than thirty days. They are our earliest vernal species and are not yet described.

In an article published ten years ago in the *Proc. of Ent. Soc. of Phila.*, describing several new species of Cynips, I ventured to remark that probably some of the species whose galls are formed on the leaves deposit their eggs in the embryo leaves, the leaf buds of the following year being formed at the time these insects appear.

This seems to be true only in part. It is at another time and by another brood that the eggs are so deposited.

In the same article I gave it as my opinion that the woolly galls of *C. q. operator*, O.S. and *C. q. seminator*, Harris were the abnormal developement of the embryo leaves, and that the wool was an enormous growth of the pubescence of the leaf. To this view the late Mr. B. D. Walsh objected, either in a published article or in a letter to myself, saying the galls were not connected with the leaf buds.

Last spring I was so fortunate as to find two galls of *C. q. seminator* in the earliest stage of growth ; so young that I did not recognize their true character, being simply large buds just beginning to open, but exhibiting

on the summit a beautiful rose-coloured pubescence. I watched them till they were mature and had the satisfaction of seeing them develope into two fine galls of this not very common species.

My friend, Mr. L. S. White, of this city, like a true chemist, as he is, suggested the idea of *weighing* the specimens of new insects we describe and tried his plan upon the gall flies taken the other day. The species taken on the buds of *C. q. operator* weighed 4½ millegrammes, while another species, probably *C. q. globulus*, Harris, weighed alive 18 millegrammes. This last was taken on a bud of the White Oak.

Slowly, year by year, the above and other quite as interesting fragments in the history of the Cynipidæ have come to my knowledge, and I hope to live to see their history fully written. It is in such investigations of the *habits* of insects that our real work and our highest enjoyment as Entomologists consists.

A GLIMPSE OF INSECT LIFE.

BY PROFESSOR BELL, OF BELLEVILLE.

While looking over some old memoranda a few days ago, I found the following, which may prove interesting to the readers of the ENTOMOLOGIST:

In the summer of the year 1830, while residing in the northern part of the County of Northumberland, England, in the capacity of a farm student, I was requested to carry out a sentence of death upon a worthless cur, which had been condemned as an incorrigible cattle chaser. After the execution, I dragged the carcass across some fields to a small clump of Willows near the river Till, and deposited it as an insect trap in a hollow, which, from having been long under water, was devoid of vegetation. In a short time the decomposing carcass became the resort of an immense crowd of the common Blow-fly, *Musca carnifex*, under whose manipulations it soon became a seething mass of the largest, fattest and liveliest of maggots. It also attracted a number of the Silphidæ, especially *Necrophorus humator*, *N. vespillo*, and *Necrodes littoralis*. After capturing as many specimens of these insects as I wanted, I was much interested in observing their proceedings. About forty of them had established a sort of encampment under the vertical wall of the hole, about thirty inches from the carcass, to which each individual ever and anon made a raid and captured a fine fat maggot, which he bore off writhing and wriggling in his mandibles to the camping ground, where it

was speedily devoured, when its captor made another incursion and carried off another victim.

During the half hour that I watched their manœuvres, each one consumed one maggot and set out in search of another about once in five minutes; and as they appeared to keep this up all day until late in the evening, and perhaps all night long, the quantity of maggots destroyed must have been quite considerable. One gigantic fellow of a *humator* particularly distinguished himself in this predatory warfare, making about three incursions to two of any of the others. I captured him finally, and found him rather to exceed two inches in length.

After the lapse of a few days the maggots disappeared into the earth, there to undergo their final transformation, when the burying beetles left the place, and were succeeded by the *Silpha rugosa* and one or two of its congeners, numerous specimens of which frequented the remains for a time; and even after the softer parts had all disappeared, I took from the bones several individuals of two or three species of *Nitidula*.

I never observed the *Necrophorus mortuorum* near the carcass of the dog, though within half a mile, in the pine woods of Ewart Park, it was very numerous on the bodies of crows and other carrion birds which had been shot and left lying by the gamekeeper; and though I took several specimens of *N. vespillo*, and of another nearly allied species of which I do not remember the name, in comparing with the *N. mortuorum*, I never met with a single individual of the *N. humator* or the *Necrodes littoralis* in the pine woods.

The question has often been debated whether flies eat the pollen of plants, or merely carry it away accidentally on their legs and backs. The question would appear to be set at rest by a paper read at the last meeting of the Scientific Committee of the Royal Horticultural Society by Mr. A. W. Bennett, in which it is stated, as the result both of his own observations and of those of Erm. Muller, that the microscopic examination of the stomachs of Diptera belonging to the order Syrphidæ, shows them to contain large quantities of pollen-grains, especially of plants belonging to the order Compositæ. Entomologists had expressed a doubt as to whether it were possible for insects possessed only of a suctorial proboscis to devour such solid bodies as pollen-grains; but Muller believes that the transverse denticulations found in the valves at the end of the proboscis of many Diptera are especially adapted for chewing the pollen-grains, and for dividing the threads by which the grains are often bound together.

INSECTS OF THE NORTHERN PARTS OF BRITISH AMERICA.

COMPILED BY THE EDITOR.

From Kirby's Fauna Boreali-Americana: Insecta.

(Continued from Vol. 4, Page 235.)

FAMILY GALERUCIDÆ.

292. GALERUCA OLIVIERI *Kirby.*—Length of body 3¼ lines. Taken in Canada by Dr. Bigsby.

Very near related to *Galeruca quadrimaculata* F. Body long, glossy, reddish-yellow: posterior part of the head black, a cross impressed between the eyes; antennae dusky with the four first joints rufescent: prothorax impunctured, transversely subimpressed behind, sides margined: elytra very minutely and lightly punctured with punctures just visible under a good lens; at the base of each elytrum nearest the suture is a roundish black spot, and another large oblong one extends from above the middle towards the apex; posterior thighs a little incrassated; tarsi dusky, especially at the apex; medipectus and postpectus black.

[Synonymous with *Phyllobrotica decorata* Say. Taken in "Canada, Lake Superior, Illinois; rare. In the ♂ the 5th ventral segment is very large, canaliculate, deeply excavated behind, with a small testaceous triangular appendage projecting over the 6th segment. The disc of the thorax is not impressed." Le Conte.]

[219.] 293. GALERUCA CANADENSIS *Kirby.*—Length of body 4 lines. Taken in Canada by Dr. Bigsby.

Body elongate, hairy with short decumbent cinereous hairs or down, dirty-rufous, underneath black. Head with a black vertical spot; six last joints of the antennae black, the others, except the scape, rufous black at the tip; scape rufous, black above; prothorax transversely impressed, sides posteriorly oblique with a slight sinus; three equidistant irregular black spots or dots placed transversely on the disk; the two elytra taken together have three black stripes, the intermediate or sutural one being common to both, and converging with the lateral ones at the tip; anus obscurely rufous.

[Belongs to Le Conte's genus *Trichabda*. "A common species extending from Lake Superior and the Mississippi Valley to the Pacific." Le Conte.]

294. GALERUCA SAGITTARIÆ *Gyll.*—Length of body 2¾ lines. Several specimens taken in Lat. 54°. Taken also by Dr. Bigsby in Canada.

Body brown, a little downy, not glossy. Mouth dirty-yellow; prothorax transverse, impressed, reddish-yellow, with three black nearly confluent spots; scutellum subquadrangular, truncated at the apex; elytra grossly but not thickly punctured; suture and lateral margin paler than the rest of the elytrum; anus and legs reddish-yellow; tarsi darker.

VARIETY B. With the base of the antennae yellowish underneath, the black spots on the prothorax distinct, and the elytra entirely of a brownish yellow.

["Found throughout the middle and northern parts of the Atlantic district." Le Conte.]

[220.] 295. GALERUCA BILINEATA *Kirby*.—Length of body 2 lines. A single specimen taken in Lat. 54°.

Nearly related to the preceding species, but smaller, the whole of the head is rufous, the joints of the antennae are shorter; the prothorax is longer in proportion to its width; and the elytra, nearer the suture than the lateral margin, have two somewhat elevated approximated blackish ridges, the interior one being the shortest and extending from near the middle to the base, and the other reaching neither base nor apex.

[Considered by Le Conte as probably a specimen of *G. notulata* Fab., with indistinct markings.]

296. GALERUCA MARGINELLA *Kirby*.—Length of body 3 lines. A single specimen taken in Lat. 65°.

Body very black, a little downy. Mouth and base of the first joint of the antennae subtestaceous or reddish-yellow; prothorax wider than long, impressed and confluently punctured on each side, with a longitudinal dorsal channel; behind the margin has a slight sinus; reddish-yellow with three black spots, the intermediate one being the smallest; elytra grossly and thickly punctured; lateral margin and apex reddish-yellow; legs dusky-yellow; last ventral segment of the abdomen yellow and deeply emarginate.

[Le Conte refers a specimen from Fort Simpson, Hudson's Bay Territory, to this species.]

[221.] FAMILY SAGRIDÆ.

297. ORSODACNA TIBIALIS *Kirby*.—Length of body 2¾ lines. A single specimen taken in the journey from New York to Cumberland-house.

Body piceous; underneath hoary with decumbent hairs; above naked, glossy, thickly punctured. Palpi and two last joints of the antennae obscurely rufous; front between the eyes with a transverse levigated elevation; prothorax longer than wide, constricted at the base; lateral margin and epipleurae or side-covers of the elytra, except at the base, yellowish-red; thighs, at the base, and tibiae reddish-yellow, the four posterior tibiae darker at the apex.

[Taken at Lake Superior by Agassiz's Expedition.]

298. ORSODACNA CHILDRENI *Kirby*.—Plate vii, fig. 6. Length of body 2¾ lines. A single specimen taken in Lat. 54°.

[222.] Body above punctured, naked. Head and its organs yellow, with the eyes, occiput, and apex of the mandibles black; a levigated transverse elevation of the front, as in the preceding species; prothorax longer than wide, constricted at the base, with an impression in the middle, pale-yellow, disk embrowned; scutellum rufous; elytra rather paler than the prothorax, with a stripe adjoining the lateral margin, an angular band beyond the middle and the base, black; antepectus, anus, and legs, yellow, rest of the underside of the body is black, and hoary with decumbent white hairs.

[Taken in Canada.]

FAMILY DONACIADÆ.

299. HÆMONIA NIGRICORNIS *Kirby*.—Length of body 3⅔ lines. Taken in Canada by Dr. Bigsby.

This species is considerably larger than *H. Equiseti* and *Zosteræ*, from which it is perfectly distinct. Body luteous above and glossy; underneath it is covered with a thick coat of pale, decumbent, rather silky hairs, with somewhat of a golden splendor, if these are rubbed off, the colour of the breast and basal abdominal segment is black. Head hairy, dusky, with a levigated naked testaceous longitudinal elevation between the eyes; antennae black, robust, very little longer than the prothorax; prothorax

subquadrangular with prominent anterior and posterior angles making it appear constricted in the middle, it is channelled with an irregular discoidal impression on each side; a few large dusky punctures are observable where the channel terminates; elytra with ten equidistant rows of large punctures which converge at the apex; besides these there is an abbreviated row at the base next the suture, as in many *Harpalidæ*, &c., the apex of the elytra terminates in two teeth or spines; the inner one short and dentiform, the outer one long and spiniform; legs and anal portion of the abdomen yellow, the former with all their articulations dusky at the extremity.

The sculpture of the elytra in this species much resembles that of another aquatic genus *Haliplus*, Lat.

ON SOME OF OUR COMMON INSECTS.

5. *THE GRAPE VINE PLUME.—Pterophorus periscelidactylus.*

BY W. SAUNDERS, LONDON, ONTARIO.

During the latter part of this month and early in June those who have grape vines under their charge are often annoyed at finding the terminal leaves of the young and tender branches tied by means of silken threads into a sort of ball shaped mass, and within the hollow sphere thus formed is found a small whitish hairy caterpillar, which feasts on the tender leaves and young blossom bunches. Usually but a single occupant is found in each enclosure, but occasionally we have found two, and, in one instance, three.

Fig. 15.

The very young larva is said to be smooth, or nearly so, the hairiness becoming more perceptible after each moult.

In fig. 15 this larva is represented nearly full grown at *a*. It is then about half an inch long with a small yellowish green head, with a band of black across the front, and a yellowish green body, with transverse rows of dull yellow tubercles from each of which arises a small tuft of white

hairs. There is a darker green line down the centre of the back, and the colour of the body becomes a little paler between the segments or rings. The under side is somewhat darker in color than the upper, with a few whitish hairs. It becomes full grown about the middle of June, and then changes to a chrysalis.

The chrysalis, fig. 15, *b*, is a very odd looking thing, nearly half an inch long, angular and rugged in outline. It wriggles and twists about very briskly when touched. At first it is of a pale yellowish green colour, which gradually changes to a reddish brown. We have often found them attached to the under side of the leaves.

In less than a fortnight the moth, *d*, fig. 15, makes its appearance. It is an elegant little creature; its wings are very delicately constructed and measure, when expanded, about seven-tenths of an inch. The fore wings are long and narrow and cleft down the middle about half way to their base, the posterior half of the wing having a notch in the outer margin. They are of a yellowish brown colour and metallic lustre, with several dull whitish streaks and spots. The hind wings are divided into three lobes; the lower division is complete, extending to the base, while the upper one is only about two-thirds as deep; their colour is yellowish brown also, with the same burnished metallic appearance, and with a streak of dull white on the hinder lobe. The outer and hind margins of the wings, as well as all the edges of their lobes, are beautifully bordered with a deep whitish fringe, sprinkled with brown. The body of the moth is long and slender, and of a little darker colour than the wings; the legs are also long, banded alternately with yellowish brown and white, and powdered with metallic scales. The unnatural grouping of the leaves when fastened together to form the home of this insect while in the larval state, leads to its ready detection, when it may be easily crushed with the hand. It is very generally distributed throughout the provinces of Ontario and Quebec.

ADVERTISEMENTS.

EXCHANGE.—I am desirous to exchange English for Canadian or American Lepidoptera. J. C. WASSERMAN, Beverly Terrace, Cullercoats, North Shields, England.

COLEOPTERA FOR SALE.—A number of Rocky Mountain Coleoptera will soon be for sale in sets by JOHN AKHURST, 19, Prospect Street Brooklyn, N. Y.

TO CORRESPONDENTS.

J. C. WASSERMAN.—Plusia balluca is very like P. chrysitis. We know the latter insect well.

The Canadian Entomologist.

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ON SOME OF OUR COMMON INSECTS.

6. *THE RASPBERRY SAW-FLY—Selandria rubi*, Harris.

BY W. SAUNDERS, LONDON, ONTARIO.

Although this insect is quite generally distributed and very destructive to the foliage of the raspberry, it has, strange to say, been but little noticed by Entomologists in their publications. There is a short reference to it in "Harris' Entomological Correspondence," in a letter from Darling to Harris, written in 1846, where a very correct account is given of the manner in which the egg is deposited. There is also a much briefer notice in "Packard's Guide," and these are all the references we have been able to find.

The perfect insect, which is a four-winged fly, appears on the wing about the middle of May. We noticed them this year first on the 10th, last season they were not observed until the 21st, and they may be found from this time until early in June. The wings, which are transparent, with a shining surface and metallic hue, measure when expanded about half an inch across; the veins are black with a streak of black along the front margin, extending more than half way towards the tip. The anterior part of the body is black, the abdomen dark reddish. In common with some other species of *Selandria*, these flies have a habit of falling to the ground when disturbed, especially in the cool of the morning, and remaining in this position long enough to enable one to catch them; with the increasing heat of the day they are, however, much more active, and take wing readily when approached.

The egg, as it appears when squeezed from the body of the female, is about one-thirtieth of an inch long, and a little over one-hundredth of an inch wide at its widest portion. In form it approaches a long oval, rather

obtuse at the ends, with its greatest diameter a little before the middle. Colour white, with a faint yellow tinge and a smooth, glossy surface, semi-transparent. The enveloping membrane is very thin and easily ruptured, discharging watery looking contents. Only seven or eight eggs were obtained from the body of the female examined; possibly it might have previously deposited most of its stock. The eggs are buried beneath the skin of the leaf, close alongside of the ribs and veins, placed there by means of the saw-like apparatus with which the female is provided, where it swells somewhat and produces a slight discoloration of the cuticle on the upper surface. The skin covering the under surface of the swelling is so thin and semi-transparent that the movements of the larva may be observed a day or two before hatching, by the black spots on the side of the head showing through. The larva escapes through an irregular hole made on one side of the swelling.

The young larva as it appears when fresh from the egg. Length, when in motion, about one-twelfth of an inch. Head large, semi-transparent, greenish-white, with a large black eye-like spot on each side and with a number of short whitish hairs; mandibles pale brown.

The body above is nearly white, semi-transparent, and thickly covered with transverse rows of white spines, nearly all of which are forked towards the tip; some of the spines on the anterior segments are more compound, having four or five branches; the tips of all the branches of the spines are blunt, nearly rounded. The under surface is similar to the upper in colour and semi-transparency, feet and prolegs partake of the general colour.

After the first moult the head is medium sized as compared with the body, of a pale yellowish green, covered with short fleshy looking hairs of the same colour. The body above is of a uniform pale greenish-yellow colour, excepting along the dorsal region, where, owing to the transparency of the skin, the internal organs show through of a deeper shade of green. The surface of the body is thickly set with short greenish-yellow tubercles, most of which are forked at the tips, the two branches spreading in opposite directions, the greater portion of them extending anteriorly and posteriorly. Out of three specimens of this age examined, one varied from the others in having a pale brownish-yellow head. The under surface, feet and prolegs all pale greenish-yellow.

With the subsequent moultings slight changes take place in the colour of the head, first pale brownish or greenish-brown, then bluish-green, and

sometimes the branches of the spines assume a brownish tint, especially on the anterior segments.

When full grown this larva measures a little over half an inch; it is nearly cylindrical, tapering slightly towards the hinder segments.

The head is rather small, nearly globular, pale green with a faint yellowish tinge, and a dark brown dot on each side, and a few very fine short hairs visible only with a strong magnifier. The mandibles are tipped with brown.

The body above is dark green, thickly set with green tubercles, from which proceed fleshy looking, forked, pale green, hair-like branches, most of them with their branches extending anteriorly and posteriorly On the anterior part of the second segment there is a row of four spines with five branches each, most of the others are forked, but some few of them have three branches each. There are eight spines or tubercles on most of the segments, arranged more or less perfectly in a double transverse row. In some specimens the hair-like branches or appendages are black at the tips, and occasionally entirely black from the point of divergence.

The under surface is similar to the upper; feet and prolegs green.

When mature—from the middle to the latter end of June—these larvæ penetrate below the surface of the ground, where they construct little oval earthy cocoons, formed by glueing together particles of earth with silky and glutinous matter. These cocoons are toughly made, and may be taken out of the earth in which they are embedded and even handled roughly without much danger of dislodging the larvae. The specimens which we have bred, when examined a week or two after the cocoons were constructed, were still in the larval condition, although somewhat contracted in length. They all dried up and died before changing to pupae, so we are as yet unable to indicate when this change takes place, the appearance of the chrysalis or its duration. As we have not met with more than one brood in the season, it is probable that the larvae remain in the ground for some weeks unchanged, gradually transform to pupae and remain under ground in this condition until early the following spring.

SCIENTIFIC PUBLICATIONS.

BY THE EDITOR.

From both sides of the Atlantic we continue to receive a continuous and ever-welcome stream of serial publications, on various scientific subjects. In all of those devoted to general Natural History our favorite department of Entomology receives its due share of attention, while there has been no recent diminution in the number of publications specially devoted to this branch of Zoology. To Practical Entomology we find more and more space and attention directed, year by year, in the leading agricultural magazines and newspapers; few, indeed, of the latter are now considered complete without the regular contributions of an Entomological Editor. The various State Entomologists continue, too, to afford us their annual Reports, filled with great stores of most valuable information, not only for the farmer and gardener, but for the student of nature as well.

As we have not for some time directed the attention of our readers to the scientific serials that we are constantly receiving, we propose to devote rather more space than usual in this issue to the enumeration of the principal papers that are of interest to the Entomologist. We take the opportunity also of returning our grateful thanks to the Authors, Editors and Publishers who, month by month, and year by year, favour us with their much valued productions.

To turn to the old world first.—No more welcome visitor comes to our table than the weekly numbers of *Nature* (London: Macmillan & Co.) This most interesting publication has now entered upon its eighth half-yearly volume, and is evidently thoroughly well established in public estimation. Recent numbers contain numerous articles and letters by leading men of science on the much vexed subject of Instinct and Perception in Animals. During the last month there have also appeared the first two of a series of illustrated articles by Sir John Lubbock on "The Origin and Metamorphoses of Insects," and a paper by Mr. A. Murray on "Venomous Caterpillars."

Science Gossip (London: Hardwicke) is replete with matter of a lively and popular character. During many months past there have been published in its pages a useful series of articles on "Collecting and

Preserving" objects of Natural History in all departments. No. 101, for May, 1873, is now before us; it opens with an illustrated account of the plant-crystals, Raphides, &c., by Prof. Gulliver; then follows "Notes on Collecting and Preserving Land and Fresh-Water Shells;" "Records of Rare Plants," the "Origin and Distribution of the Insects of the British Isles," "Comparative Size of Animal Hairs," 'Gossip' on Microscopy, Zoology, Botany, Geology, &c.

The Scottish Naturalist (Perth, Scotland) is an excellent quarterly magazine of Zoology and Phytology, published by the Perthshire Society of Natural History. With the number for January last the second volume was commenced, and the size of the publication enlarged from 32 to 48 pages—a notable sign of progress. Among the articles of interest in the last two numbers we may mention that on "The Occurrence of the Hooded Seal at St. Andrews," by Mr. R. Walker; "Memoirs on Scottish Tenthredinidæ," with a beautiful colored plate of *Nematus gallicola*, by Mr. P. Cameron, jun.; a paper by the Editor (Dr. F. Buchanan White) on the extraordinary occurrence of *Vanessa antiopa* in Great Britain last year; papers on Scottish Diptera, Spiders, Tortrices, Galls, &c., by various authors; an article on "Polarity in the Geological Distribution of Genera," by the Rev. J. Wardrop; and instalments of an excellent "Insecta Scotia"—Lepidoptera and Coleoptera. We heartily wish the publication the fullest success.

Newman's Entomologist (London: Simpkin, Marshall & Co.) and *Zoologist* (Van Voorst)—for which we are indebted to our friend Mr. Reeks—continue to maintain their respective characters: the former as a recorder of captures, varieties, 'exchanges,' &c.; the latter chiefly as an Ornithological magazine, though singularly enough, we always find in it the fullest and best reports of the meetings of the Entomological Society of London.

The Entomologist's Monthly Magazine (London: Van Voorst) appears to us to be better maintained and of more general interest than formerly.

From the authors we have received *Notes on Chalcidiæ* (Parts i to vii), by Francis Walker, Esq.; *Note on a Chinese Artichoke Gall*, by Albert Muller, Esq. (from the Linnean Society's Journal); and two papers *On Modern Glacial Action in Canada*, by the Rev. W. Bleasdell (from the Quarterly Journal of the Geological Society).

Turning to this side of the Atlantic, we may notice first the *Proceedings and Transactions of the Nova Scotian Institute of Natural Science* (Part ii.,

vol. iii). The number opens with the conclusion of Mr. J. M. Jones' paper on "Nova Scotian Lepidoptera;" among the other articles we would especially mention "The Mammalia of Nova Scotia," by Dr. Gilpin, "On Parallel Lines of Elevation in the Earth's Crust," by Mr. A. Ross, and "The Human Teeth," by Dr. A. C. Cogswell.

The *Proceedings of the Boston Society of Natural History* (vol. xv., part i., Jan.—April, 1872), are chiefly occupied with an able geological article by Mr. John B. Perry, on the "Post-Tertiary History of New England."

The Annals of the Lyceum of Natural History of New York (vol. ix and vol. x, Nos. 1–7) contain, amongst a large number of able papers on all branches of Natural Science, two portions of the late Mr. Coleman Robinson's "Lepidopterological Miscellanies." The *Proceedings* of the same Society from April, 1870 to April, 1871, contain a number of short interesting articles, among which we notice a large proportion on Microscopy, by our friend Prof. A. M. Edwards.

The *Proceedings of the Academy of Natural Science of Philadelphia* (parts ii and iii, May—Dec., 1872) contain but one short article that bears any reference to Entomology—"On the Agency of Insects in Obstructing Evolution," by Mr. Thos. Meehan.

The American Naturalist (Salem, Mass.), vol. vii, Nos. 1—4. This excellent publication is maintained with undiminished vigour by its energetic proprietors, Profs. Packard & Putnam. The numbers of the current volume now before us contain the following articles on Insects:—"Harvest Mites," by Prof. Riley; "Controlling Sex in Butterflies," by Mrs. Mary Treat, in which the authoress is unkind enough to suggest that male butterflies are produced only from half-starved larvæ, the full fed specimens producing females!—this new phase of 'women's rights,' though based upon experiments, we cannot but regard as a fortuitous coincidence in the cases referred to, and by no means a law of nature; "A Viviparous Fly," by Rev. S. Lockwood; and "The Cotton Caterpillar," by Mr. L. A. Dodge.

The Bulletin of the Buffalo Society of Natural Sciences—vol. i, No. 1, April, 1873—is a new addition to the list of scientific serials, and one that we trust will be warmly supported by all naturalists throughout America. It is to be published quarterly, in octavo form, thirty-two pages at least forming a number. The copy before us contains four valuable articles, all

from the pen of Mr. Aug. R. Grote, viz.: 'Descriptions of new North American Moths,' illustrated with a plate; 'Catalogue of the Sphingidæ of North America,' 'Catalogue of the Zygænidæ of North America,' and 'Conclusions drawn from a Study of the Genera Hypena and Herminia.' This list of contents will, we trust, be sufficient to cause our Entomological friends to send for the publication, and thus aid its permanent establishment.

Monthly Report of the Department of Agriculture (Washington, D. C., April, 1873). The "Entomological Record" in this number contains an illustrated paper by Prof. Townend Glover, on the Tobacco and Potato worms (*Macrosila Carolina* and *quinque-maculata*).

The Canadian Journal (Canadian Institute, Toronto, May, 1873) and *The Canadian Naturalist* (Montreal: Dawson Brothers, vol. vii, No. 1) maintain their respective characters as literary and scientific periodicals.

The Canada Farmer (Toronto, vol. x, No. 9—May 15, 1873) is now issued fortnightly instead of monthly, and is much improved both in form and matter.

The Canadian Patent Office Record and Mechanics' Magazine (Montreal: G. E. Desbarats) is a new and attractive candidate for public favour. The first number, now before us, is profusely and handsomely illustrated; it consists of two parts, the official portion giving a record of inventions patented at Ottawa during the preceding month, with illustrations of the majority—the present issue contains no less than 237 diagrams; and the unofficial or magazine paper affording elaborately illustrated articles on Engineering, Mechanics, Manufactures, &c. The work is well got up and deserves to become a great success.

Our limited space forbids our doing more at present than briefly acknowledging with thanks the receipt of the following publications:—*The American Agriculturist; The Horticulturist; The Weekly Sun*, and the *Rural New Yorker*, from New York; *The Prairie Farmer*, Chicago; *The Maine Farmer*, Augusta, Me.; *The North Western Farmer*, Indianapolis; *The Journal of Education*, Toronto; *Geological Survey of Canada*, Report of Progress for 1870—'71, and *The Statutes of Canada*, 1872, from the Department at Ottawa; *The Canadian Almanac*, 1873, Copp & Clark, Toronto; *Catalogue of the Birds of Canada*, by Dr. A. M. Ross, Toronto; *Directions for Collecting Coleoptera*, and a *Catalogue* of species of the order, by Geo. Dimmock, Springfield, Mass. The Reports of State Entomologists, now being issued, we hope to notice in our next number.

OUR SPECIFIC NOMENCLATURE.

BY THEODORE L. MEAD, NEW YORK.

In the article published in the April number on the subject of nomenclature, it is stated that Mr. Scudder, in his Revision, has followed the same principles which govern all other departments of Zoology. It would be interesting to know what these universally adopted principles may be, for, judging from the recent publications on the subject, they must be yet unknown to a great number of those eminent in science. Mr. Wallace, than whom we have no higher entomological authority, in his address to the London Ent. Soc., recommends English naturalists to follow the British Association rules until others may be assented to, while these same rules find scant acceptance in Germany or France.

In regard to species having been described, not by naturalists but by amateurs, this may be conceded in Hubner's case, but the term will hardly apply to Linnæus and Fabricius and the other authors whose species are the cause of most dispute.

Mr. Kirby's Catalogue is said to combine the results of the labor of European students, but Dr. Staudinger's elaborate and conscientious Catalogue no less had the benefit of all these investigations, with the result of hopeless variance as far as both works cover the same ground, and that too when the principles of nomenclature adopted by either author are almost identical with each other and with those which Mr. Scudder apparently follows. In the group of insects best known and most studied, the British Diurnals, these two authors differ as to the specific names of one seventh of the entire number. This is the result of rigidly following the law of priority, which *should* at once and forever decide every possible case of synonymy. That does not seem encouraging, for both authors in nearly all cases make the references to the same obsolete and unrecognizable descriptions.

The rule of absolute priority, adopted as paramount law by a few investigators, has already brought about such a state of things as this, and alone is capable of continuing it.

Let the first law be stability of already accepted names, then the law of priority takes its proper subordinate place to decide between names in use. Rather than the term "law of convenience," used by the opponents of this rule, though it is suggestive and to some extent appropriate, I would propose the name "*Law of Stability*" as most applicable.

All nomenclature is but a means to the end of increasing our knowledge of the organisms themselves, and for this, unchangeability of names is the first requisite. Whatever the strict law of priority theoretically should accomplish, we have seen but the beginning of the permanent confusion in which its practice results, and which its continuance as the fundamental law will hand down to the remotest generation ; each inexact description, as published, adding new material to increase the complexity of the tangled web of names.

NOTES ON HYPERCHIRIA IO (FABR.)

BY C. V. RILEY, ST. LOUIS, MO.

I have obtained many egg-masses of this species the present season and have had them deposited by moths reared in confinement. Even in a state of nature they are deposited quite irregularly, some fastened on one of the compressed sides, some piled on top of others, but most of them on the small end as in the closely allied *Maia*. The average length is 0.07, largest width 0.05, and greatest thickness 0.03 inch. They are compressed on two sides, and flattened at the apex, the attached end smallest. When first deposited they are pure cream color, with a translucent yellow spot on the flattened apex. Toward maturity the colour changes to a more intense white with a faint lilaceous tint; the yellow spot at apex becomes mostly black and the compressed sides are more or less translucent, especially the upper half, through which the yellow of the enclosed larva and some of the darker spines may easily be seen just before the hatching period. Mr. Lintner's description as "elliptical, somewhat flattened," and Mr. Minot's "top-shaped" are neither, strictly true, and would hardly enable one to distinguish this egg from many others; while my own description is not as ample as it should be. Hence these notes. The larval changes are given in my 5th Report (p. 135.) The spines of the larva in the first stage are too weak and pliant to enter the most tender skin ; and the urticating property is only ascertainable after the first moult.

MICRO-LEPIDOPTERA.

BY V. T. CHAMBERS, COVINGTON, KENTUCKY.

Continued from Page 91.

ERRATA.—For *T. cunitarœella*, *ante* p. 85, read *T. cœmeteriiella.*

PITYS.

(This is a section of *Tinea* having the wings tufted and narrower than in *Tinea.*)

Head and face rough (as in *Tinea*), tongue very short. Maxillary palpi folded; labial palpi drooping, with the terminal joint more than half as long as the second, which has a few bristles beneath; eyes globose; no ocelli. Antennae two-thirds as long as wings, filliform. Anterior wings with raised tufts of scales, the tufts generally rather brightly coloured; lanceolate, narrower than in *Tinea;* the costal vein attains the margin before the middle; discal cell closed by a straight distinct discal vein, which gives off four branches, two of them to the costal and two to the dorsal margin, one of the latter near the apex. The subcostal attains the costal margin, giving off a long branch before the middle and a shorter one near the end of the cell; the median is three branched, the two last arising together from the end of the cell; submedian simple, fold thickened at the end.

Posterior wings linear, lanceolate; costa excised from the middle to the tip? the costal vein attains the margin about the middle; the subcostal is straight to the margin before the apex; the cell is closed by a curved discal vein which gives off two branches, one to the apex, the other below it; the median vein is three branched, the terminal one having a common origin with the lower discal branch; the two others arise from the apical half of the cell. Ciliae long; submedian and internal obsolete.

1. *P. auricristatella. N. sp.*

Pale gray, with intermixed brown scales. Head hoary; a small scattered patch of raised golden scales within the costal margin near the

base, and a similar one opposite near the dorsal margin; another large one just before the middle, another small one within the costal margin behind the middle, and a fascia of raised golden scales before the ciliae; a few scattered golden scales in the apical portion behind the fascia. *Al. ex.* over ¼ inch. Kentucky.

2. *P. fusco-cristatella. N. sp.*

Head and palpi sordid yellowish-gray; antennae pale fuscous; thorax brown above, with a brown patch on each side under the base of the wings; basal three-fourths of the anterior wings sordid white, yellowish, and brown scales intermixed, the apical fourth fulvous and separated by a distinct line, which is convex towards the apex. An obscure cloudy spot near the base of the wing; at about the basal third are two dark brown patches of raised scales, one of which is on the disc, the other within the dorsal margin; about the apical third are two similar tufts similarly situated. About six small white costal streaks on the apical half of the costa. *Alar ex.* ¾ inch. Kentucky.

3. *P. fasciella. N. sp.*

Grayish fuscous, overlaid with golden yellow. Anterior wings with a narrow brown border along both margins; a tuft of silver gray raised scales on the disc at about the basal third, and another opposite within the dorsal margin; a row of small oblique silvery streaks along the costal margin; just before the ciliae is a narrow fascia of raised silver gray scales, behind which, near the apex, are two indistinct narrow white fasciae not raised, the first of which is especially indistinct. In the brown dorso-apical margin are about eight small white spots. Ciliae gray. There is a brown patch on each side of the thorax just underneath the base of the wings; thorax brown; vertex brownish-red; antennae pale fuscous; palpi and face white, the second palpal joint white without. *Alar ex.* ½ inch. Kentucky.

In the general color of the wings and the costal markings this species seems somewhat to resemble *Homosetia costisignella* Clem. The genus also resembles *Homosetia* as described by Clemens, in the palpi and neuration, but differs somewhat in these respects, and *Homosetia* has no raised tufts.

4. *P. misce-cristatella. N. sp.*

Palpi whitish, the labial pair externally fuscous; lower part of the face white, upper part and vertex sordid gray; antennae pale fuscous;

thorax grayish fuscous; primaries whitish, sparsely dusted with golden brown scales and with three or four transverse patches of golden brown; about the basal fourth, in one of the golden brown patches, are two small spots of yellow scarcely raised scales opposite to each other and just within the margins, the dorsal one being the smallest. (In one specimen in place of the dorsal yellow spot is a distinct patch of brown raised scales.) In another of the transverse patches, about the middle, is another larger spot of yellow scarcely raised scales, with a small opposite dorsal patch of raised scales, and in another transverse fuscous patch, about the beginning of the ciliae, is another transverse patch or streak of whitish and brown scales with a few yellow ones intermixed. Costal margin brownish, with seven white streaks, the first three pointing a little obliquely backwards, and the last four, which are in the apical part of the wing, nearly straight or a little oblique forwards; the last two cross the wing and are concave—especially the last one—towards the apex. The brownish portions of the wing with golden reflections in some lights. *Al ex.* 3/8 inch. Kentucky.

The specimen above mentioned in parenthesis has the apex of the wings a little worn and I cannot distinguish the costal streaks in that part of the wing. Possibly it may be a distinct species, but I think not.

The foregoing sub-genus is allied to *Tinea* both in the trophi and the neuration of the wings. Nevertheless, it differs decidedly from that genus in the neuration. In the neuration of the wings and their tufts of raised scales it is allied to *Xylesthia*, but differs decidedly from it in the trophi; and the antennae differ decidedly by their increased length. In this respect and in the neuration and palpi it approaches nearer to Clemens' sub-genus (of *Tinea*) *Homosetia*, but that sub-genus has no raised tufts upon the wings, and the neuration is not exactly the same.

CYANE, *gen. nov.*

This genus is very near to *Tinea*, the principal differences being in the form and neuration of the hind wings (in which respects different species of *Tinea* by no means agree with each other), in the absence of bristles on the palpi, and the ciliated antennae. The general appearance of the insect in repose is that of a *Gelechia*, and such I supposed it to be when it was captured. It also approaches that group in the form and neuration of the hind wings.

Primaries lanceolate, ovate : the costal vein attains the margin about the middle ; discal cell wide and closed ; the subcostal is obsolete towards the base, and sends a long branch from near the base to the margin behind the cell, two shorter branches from near the end of the cell, and then proceeds to the costal margin before the apex ; the median sends one branch from near the end of the cell to the closed margin, and then proceeds from the end of the cell to the dorsal margin ; the discal gives off four branches, one to the costal margin near the apex and three to the dorsal margin. Submedian simple.

Secondaries a little wider than the primaries, with the costal margin very faintly excised from the base to near the middle, and slightly arched thence to the apex. Posterior much and regularly curved and apex rounded. The costal vein is close to the margin, but only attains it in the apical fourth of the wing. Subcostal obsolete towards the base, nearly straight and attaining the costal margin just before the apex ; discal cell wide and closed : the discal vein gives off two branches to the dorsal margin : the median sends from about the middle of the wing a curved branch to the dorsal margin and proceeds to the end of the cell and thence to the dorsal margin : submedian and internal veins distinct and simple.

Head roughened (as in *Tinea*). Antennae little more than half as long as the primaries, tapering from the base to a point at the apex, with a distinct shoal of ciliae on each joint. Tongue ? (concealed by the maxillary palpi, which are folded) ; labial palpi drooping in the dead insect (or perhaps more properly called incurved), without bristles, long enough to reach the eyes if recurved (as I think they are in the living insect), with the second joint as long as the first and third united, the third vertically compressed and with the scales roughened. Eyes, globose, moderate; ocelli none.

C. visaliella. N. sp.

Maxillary palpi white ; labial palpi white, outer surface of the second joint, except at the apex, and a spot on the outer surface of the third joint brownish ; head whitish gray with some brown scales intermixed ; antennae with alternate white and brown annulations ; thorax and primaries pale or whitish gray, sparsely dusted with brown, a small brown spot on the base of the costa, a smaller one about the basal fourth, and a very large one just behind the middle touching the costa and crossing the fold ; apical portion of the wing brownish, with some whitish and gray

scales intermixed, and with two small oblique costal white streaks just behind the large brown spot; costal ciliae dark brown, dorsal ciliae grayish. *Alar ex.* 3/8 inch. Several specimens captured in June resting on forest trees, at Visalia, Kentucky.

CLYMENE, *gen. nov.*

Clothed with longish hair-like scales, those of the head and face roughened, standing out in every direction, many of those of the anterior wings also standing out (or rather reversed, suggesting a resemblance to the breed of chickens with reversed feathers).

No tongue; labial palpi short; maxillary palpi long, three jointed, the second and third joints sub-equal, drooping together or sometimes folded in the dead insect (folded in the living?). Antennae more than half as long as the wings, hairy, somewhat roughened in the living insect, carried projecting together straight in front; eyes small, not visible from above.

Forewings lanceolate; there is a long semi-opaque space on the costal margin; discal cell unclosed; costal vein short; subcostal nearly straight, passing to the apex, giving off to the costal margin four branches, the first from about the basal fourth, the second and longest from just before the middle and attaining the margin just before the other two, which are given off in the apical part of the wing; the median passes nearly straight to the dorsal margin behind the apex, from about the basal fourth it gives off a long branch which attains the margin just behind the vein itself, which is trifurcate in the apical part of the wing; fold very distinct; submedian furcate at base.

Posterior wings lanceolate; costal vein almost coincident with the margin; subcostal straight to the apex, sending to the costal margin two short branches, the first behind the middle, the second in the apical portion; median vein nearly straight to the dorsal margin behind the apex, sending to the dorsal margin two branches, one not far from the base, the other about the middle; submedian distinct. Ciliae moderate.

The imago is very shy and active, running very rapidly till it finds a place of concealment, and taking flight easily. The larva of the species described below is unknown; the imago is abundant in May and June upon the trunks of Beech trees.

C. ægerfasciella. N. sp.

Head luteous with intermixed dark brown scales; palpi dark grayish fuscous; legs and body sordid luteous; antennae sordid luteous, mixed

with dark grayish fuscous: thorax and anterior wings dark purplish brown with a faint whitish spot on the dorsal margin near the base, a faint narrow whitish fascia about the middle, and a faint whitish costal and similar dorsal spot opposite, just before the ciliae, and another similar spot at the apex; these spots are all very indistinct. Ciliae fuscous. Posterior wings grayish fuscous. The ends of the fascia on each margin are visible as whitish spots in the wing itself after it is denuded. *Alar. ex.* ¼ inch. (The wings are much longer than the body.) Kentucky.

INSECTS OF THE NORTHERN PARTS OF BRITISH AMERICA.

COMPILED BY THE EDITOR.

From Kirby's Fauna Boreali-Americana: Insecta.

(Continued from Page 99.)

[223.] 300. DONACIA FEMORALIS *Kirby*.—Length of body 3¼ lines. Taken in Nova Scotia by Dr. MacCulloch.

Body bronzed, gilded, with a greenish tint, very minutely and thickly punctured, not conspicuously hairy underneath. Frontal channel slight; antennae, except the scape which is bronzed, and mouth rufous; prothorax with an impression above the scutellum; anterior tubercles more than usually prominent; scutellum rather large; elytra with single slight anterior impression adjoining the suture; legs rufous, but the thighs, which are much incrassated, except the base and summit, are green-bronzed; posterior thigh without any tooth; abdomen as in the preceding species.

This species seems nearly related to *Donacia pusilla* Say.

301. DONACIA FLAVIPES *Kirby*.—Length of body 4 lines. A single specimen taken in Lat. 65°.

Body bronzed-copper with a golden lustre; clothed below with very short, somewhat silvery, decumbent hairs, the metallic splendor of the body being visible through them. Head thickly, minutely, and confluently punctured or wrinkled, channelled between the eyes; antennae testaceous, longer than the prothorax; prothorax subquadrangular, longer than usual in the genus, widely channelled, very minutely, thickly, and

confluently punctured and wrinkled; anterior tubercles large and not prominent: elytra with two impressions adjoining the suture, elevated at the base; legs testaceous.

[Taken in Ontario and at Lake Superior].

302. Donacia affinis *Kirby*.—Length of body 3¾ lines. Taken by Dr. MacCulloch in Nova Scotia.

Body minutely punctured, copper-coloured brilliant with the splendor of gold; underneath very slightly hairy, Head channelled between the eyes; antennae and mouth testaceous; prothorax widest anteriorly, channelled, punctured but not thickly, lateral anterior tubercles levigated; scutellum small; elytra with a single impression, not far from the base, adjoining the suture; base elevated; margin of the ventral segments of the abdomen of a fine bright, the anus of a deeper orange; legs testaceous.

Very near *D. flavipes*, but the sculpture of the prothorax, the impressions of the elytra, and the colour of the underside of the abdomen are different. It differs from *D. discolor* in having the prothorax much more thinly punctured, the anterior tubercles, which in that species are near obsolete, more prominent, and the scutellum much smaller.

[Named *D. Kirbyi* by Lacordaire.]

303. Donacia emarginata *Kirby*.—Length of body 3⅔ lines. Taken with the preceding.

[225.] Body black-blue, clothed underneath with pile, in certain lights, glittering like silver. Antennae black; tubercles of the prothorax prominent; elytra with an impression near the suture; last dorsal segment of the abdomen emarginate; thighs very thick, bronzed, posterior one with a stout tooth.

This species comes very near *D. sericea*, but it is sufficiently distinguished by its deeply notched podex, and the silver pile that clothes its body underneath, which in that species has a golden lustre.

[Taken in Canada and at Lake Superior.]

304. Donacia proxima *Kirby*.—Length of body 5 lines. Taken in Canada by Dr. Bigsby.

Body a little flattened, covered underneath with a dense coat of glittering silver pile resembling satin. Head a little bronzed, channelled between the eyes, minutely punctured; palpi testaceous; antennae entirely black; prothorax in the disk dark violet and channelled, sides bronzed

and impressed; anterior tubercles not prominent; scutellum bronzed; elytra nearly black with a slight tint of violet, punctures green-gilt, interstices of the rows not wrinkled; an anterior impression near the suture; rounded at the apex; posterior legs long, with thighs somewhat curved, attenuated at the base, armed at the apex with two teeth placed consecutively, the first long, slender, and acute; the last wide, short, and denticulated posteriorly.

This species is nearly related to *D. crassipes* Fab., but the antennae and the legs are entirely black, the teeth on the posterior thighs are not equal.

[Probably synonymous with *D. episcopalis* Lac. Taken on shore of Lake Superior.]

MISCELLANEOUS.

PERSONAL.—In part No. 2, "Lepidoptera, Rhopaloceres and Heteroceres," the author, Mr. Herman Strecker, makes a most uncalled for and ungentlemanly attack on me, which in justice to myself, much as I dislike introducing matters of this sort into a scientific periodical, I can scarcely allow to pass unnoticed.

It appears that Mr. Strecker received last summer, from Mr. Couper, specimens of a Papilio which he had taken on the Island of Anticosti while on a collecting tour there. At first Mr. S. says he thought it might be my P. brevicauda, described in a foot note in "Packard's Guide," but on comparing the description there given with his specimens, he found them to differ in some important particulars. He then proceeds to say (I copy *verb. at lit.*,) "I now again had the pleasant excitement incidental to endeavoring to study out bare descriptions, unaccompanied by figures, and in my misery I wrote to Mr. Couper, in Montreal, requesting him to try to see the types of Brevicauda, and compare his examples with them, or if that was impossible, to write to Mr. Saunders, of Ontario, Canada, who described it and with whom he was acquainted, concerning the species; after some time Mr. Couper wrote 'I communicated with the Rev. Canon Innes (in whose collection are specimens of Brevicauda) and Mr. W. Saunders, asking for information regarding P. Brevicauda; up to this instant no answer from either;' this certainly was not very satisfactory, but as I was not particularly anxious to make a fool of myself by re-christening old species, I importuned Mr. Couper to try the gentleman

with another epistolary shot; in due time, under date March 17, 1873, came another letter from Couper thus: 'I have purposely delayed a reply to your favor of 2nd, because since its receipt I wrote again to Mr. W. Saunders for the desired information, and my letter was written in terms which could not deter him from answering; however, no answer has been received.' After receiving this letter, I, of course, concluded that Mr. Saunders' time was of too much value to be encroached upon, and requested Mr. Couper to by no means trouble him again, as his dignified silence at last brought me to a proper sense of my true position, and was a merited punishment to both Couper and myself for our temerity."

I did receive the two letters referred to from Mr. Couper. In the first, dated Jan. 21, Mr. C. asks me where I obtained the Papilio described as *brevicauda*, and whether I would loan him a specimen, as he wished to compare it with some Anticosti Papilio's which had been named for him by his U. S. correspondents as *P. polyxenes*. There were other matters referred to in the letter which I wished to attend to before replying to Mr. Couper, and as I was then extremely busy, and was obliged to leave home for a while, not knowing either that there was any pressing need of an immediate answer, I deferred writing for a time. In the second letter, dated March 3rd, Mr. C. refers again among other matters to *P. brevicauda*, expresses no disappointment at my not answering his first, does not even now ask for a prompt reply, or hint that any of the information he desires was for anyone but himself. Indeed, after referring to some differences which he thought existed between his Anticosti specimens and my *brevicauda* from Newfoundland, he says: "It is *my intention* to investigate this matter further," and referred to the opportunities he hoped to have on revisiting the Island. To this second letter I replied as promptly as possible, within a few days, and gave Mr. C. all the information in my power in reference to *brevicauda*, as well as satisfactory reasons why I had not written sooner.

It was scarcely kind of Mr. Couper to give me no hint of the terrible state of excitement under which his friend, poor Mr. Strecker, was at that time laboring, boiling over, as he evidently was, with indignation towards one who was perfectly innocent of all knowledge of his wants. Had I known the state of his mind my sympathies would at once have been aroused and I should have written promptly, when I suppose this formidable bull of his would never have been fulminated against me, and I should have been spared from being impaled on the sharp end of Mr.

Strecker's irony, where, like a beetle on a pin, I am now supposed to be wriggling and writhing in great discomfort.

I do not know Mr. Strecker and have never had any correspondence with him, but I do feel sorry for him, that he should in his anger have allowed himself to use language so discorteous in reference to one who was a perfect stranger to him, without taking pains to enquire whether it was deserved or not. I can scarcely designate such a proceeding under such circumstances, as anything less than contemptible, and quite unworthy of a naturalist or a gentleman.

Mr. Strecker further remarks in the paragraph following that last quoted: "However, I believe this is distinct from Brevicauda, and if it be not, *it is an absurdity to retain that name;* the probability after all is that Brevicauda and Anticostiensis (if they be not the same) are both varieties of Asterius." Why Mr. Strecker considers it *absurd* to call a species *brevicauda* he does not deign to inform us; can it be that he has a conscientious objection to any further references to the tails of insects under any circumstances, or is it the *evident superiority* in length and grandiloquence of sound which *Anticostiensis* has over *brevicauda* which makes the use of the latter to his mind so absurd? It does seem strange that with all Mr. Strecker's anxiety to avoid "re-christening old species," he should astonish the Entomological world with such a name as *Anticostiensis* nov. sp., when at the same time he states his belief in the probability of its being but a variety of *asterias*. Such a proceeding seems at least contradictory, and, it will appear to some, as if he had thus placed himself, in his anxiety to have his name attached to a species, in the very position he professes a wish to avoid, and which he has designated in such choice! language.—W. SAUNDERS, London, Ontario.

TO COLLECTORS.–I am very anxious to obtain the eggs, larvæ in different stages, and chrysalis of *Grapta faunus*, and I will offer as a reward to any one who will obtain them for me, Vol. I of the "Butterflies of North America," or Vol. II, as it shall appear. Where this species is common, that is, in the highlands of New York and New England, or British America, it would not be difficult to obtain eggs at the proper season, and from these all the rest would follow. In the Catskill Mountains, the fresh specimens of *Faunus* appear about the 1st of August, and by the 15th are plenty. Allowing eleven days for chrysalis, the mature larvæ would be found between the 20th of July and the 5th of August. From egg to chrysalis

will be about fifteen days, and allowing four days for duration of the egg, we may conclude that this is deposited from 1st to 15th of July. Therefore, an effort should be made to take the females the last of June or first of July; and when taken, they should be enclosed in a gauze bag, on a stem of Hop, or on Nettle, Elm, and perhaps Currant or Wild Gooseberry; or enclosed in a keg, if convenient (nail or powder keg), from which the heads have been removed, and the upper end covered with a cloth, held down by one of the hoops. Care should be taken to stop up all holes next the ground by which the insect would escape. In this way eggs will infallibly be had, if the insect is confined with the food plant of the larvæ. In the present case, as that is not certainly known, if after 24 hours no eggs are found to be deposited, I should try one of the other plants named. If eggs are obtained, two or three should be placed in a small vial of water, to which has been added a few drops of carbolic acid solution, which preserves them effectually, and should be sent by mail to Miss Mary Peart, Pauling, Chester Co., Pennsylvania, for drawings for me. In the same way, the larvæ at different stages may be sent, in tin or wooden (not paper) boxes, by mail, with a supply of the food plant, advising by letter of such sending. The chrysalis may be sent in the same way as soon as formed. It is desirable that as full notes as possible should be taken of the changes of the larvæ. These I will publish, as well as the drawings, in Vol. II of But. N. A., with credit to the discoverer and observer.

In the same way, it is desirable that the larva of *G. gracilis* should be found, and I will give a similar reward for the discovery of the preparatory stages of this species, if attention is given to my directions in forwarding the eggs, larvæ and chrysalids for drawings.—Wm. H. Edwards, Coalburgh, West Va., May 24th, 1873.

ADVERTISEMENTS.

Exchange.—I am desirous to exchange English for Canadian or American Lepidoptera. J. C. Wasserman, Beverly Terrace, Cullercoats, North Shields, England.

Coleoptera for Sale.—A number of Rocky Mountain Coleoptera will soon be for sale in sets by John Akhurst, 19, Prospect Street, Brooklyn, N. Y.

The Canadian Entomologist.

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OBSERVATIONS ON CERTAIN PLANT LICE OF THE GENUS APHIS.

BY THOMAS G. GENTRY, GERMANTOWN, PA.

That the Aphides in the spring time are wingless, virgin females, is an opinion that has been carefully entertained by some of the most distinguished naturalists and physiologists in the world. Bonnet, Reaumur, Owen, Huxley, &c., have especially studied this interesting class of insects, and have given expression to the above opinion in their writings. But this, there are strong reasons for asserting, must be taken in a restricted sense, so far, at any rate, as our own Aphidæ are concerned.

Whilst engaged recently in an examination of a species which was observed feeding upon the leaves and tender shoots of *Rumex crispus*, with the view of testing its manner and rate of reproduction, several clusters of the insect were met with, each of which, contrary to expectation, contained one or two winged specimens. These, in addition to the possession of wings, differed still further from the apterous ones in the superior length of the antennæ, and in the remarkable fulness of the thorax above; this fulness being undoubtedly necessary for the attachment of the wings and the muscles by which they are controlled. In color the wingless specimens were entirely jet black, which, however, in those endowed with the power of flight, was somewhat relieved by the presence of a light fulvous annulus upon each antenna and tibia.

The presence of wings in some of the specimens at this season of the year, in view of the assertions of naturalists to the contrary, would seem to imply the existence of males. This impression does seem to be further heightened and strengthened by comparison with drawings of the male rose Aphis in "Duncan's Transformation of Insects." To be assured

upon this point, a solitary winged specimen was secured and confined in a box in which a sprig of the insect's natural food had been previously placed to satisfy its wants; due examination having been made to the intent that nothing in the shape of food or animal life should stand in the way of a fair and impartial test. After the lapse of twenty-four hours, the inside of the box and its contents were examined with a glass of moderate diameter, and a single, newly-born Aphis was discovered fastened to a leaf stalk, in the act of imbibing its juice.

A further continuance of the feeding process for several days longer was productive of the same positive results. The rate of increase in this species, as shown by these experiments, unlke its European congeners, was proved to be but one a day; so it is to be seen that the insect does not propagate as rapidly in this case at any rate, as naturalists have asserted. European species, we read, produce at the rate of three, four, and seven a day, according to eminent authorities. As our native American species differ in many points from European, in a structural as well as a functional sense, this difference in the rate of propagation may not be wondered at. From the above facts it does seem that nature has decreed that there shall be both winged and wingless specimens in the spring time, for it seems just to conclude that both varieties are virgin females. But other observations which were subsequently made, seem to foreshadow the existence of males also; but the evidence upon this point is not of the most positive character, and requires further facts to settle it beyond the shadow of a doubt.

Having secured similar winged specimens a few days later, they were submitted to a like test, when both positive and negative results were reached. Here was a rather curious and interesting problem for solution. Why some should prove fertile, and others, which in no single particular differed therefrom, so far as could be determined, should manifest a contrary state of affairs was more than could be divined, and this too after frequent experiments had been made. If the latter are males, as their sterility would seem to indicate, the solution is self-evident; but if of the opposite sex, there can be no adequate key to unlock the problem, unless the principle of excessive nutrition, which seems to account for so many strange things in the vegetable creation, should prove to be it. But even here a doubt arises, as observation has shown me that a succulent shoot produces almost invariably wingless specimens, while a less tender one the opposite variety. As the very existence of the two forms depends upon

the quantity of sap which each obtains, said quantity being measured by the nature of the shoot, whether succulent or otherwise, the only rational conclusion that can be drawn is to consider the sterile form as male. The correct course to have adopted would have been a dissection of the animal, and a comparison of the organs of reproduction, but in this I was debarred by the want of suitable instruments for the purpose.

From what has been written upon European species, combined with the facts developed in this paper, it seems safe to conclude that the Aphidæ reproduce both in a sexual and asexual manner. If not sexually, then there is no getting rid of the conclusion that in the spring of the year three forms of females are produced, wingless virgin, winged virgin, and winged sterile females. As a further confirmation of the above facts, let me add that similar experiments were performed upon a small drab-colored species, which was found feeding upon the leaves and succulent shoots of *Spiraea corymbosa*, with similar results.

NOTES ON RHYNCOPHORUS ZIMMERMANII, Sch.

BY S. V. SUMMERS, NEW ORLEANS, LA.

Larvæ, long, 1.07 to 1.40 inch. Head rather large, smooth, vertical; occiput dark chestnut brown; medial line abbreviated, but well defined; lateral lines complete; vertex piceous, sculptured; front rufo-piceous; mandibles obtuse, opaque, with three large deep impressed punctures; labium 3-dentate; mentum sinuated, sub-flavous. Body sub-cylindrical, not curved, sub-flavous, middle segments largest, humeral and anal segments corneous, brownish; legs replaced by six tubercles.

Described from seven living matured larvæ.

Pupæ, long, 1.10 to 1.24 inch. Quite characteristic of imago, tawny yellow; prothorax and metasternum piceous; rostrum bent close on prosternum, and reaching anterior margin of metasternum; elytra enclosing posterior legs. Three specimens.

R. Zimmermanii. Long (exclusive of rostrum), 0.66 to 1.20 inch. Black, shining, rostrum shorter than thorax; ♂ nearly arcuate before antennæ, smooth, with rather large punctures; ♀ not arcuate, tuberculate; antennæ with outer half of first joint rufous; eyes large, finely

granulate; prothorax longer than broad, smooth, finely and sparsely punctured; angles rounded; basal margin closely embracing elytra; scutellum prolonged, polished; elytra with six distinctly punctured striæ which do not quite reach the apex; intervals broadly rounded.

Inhabits Southern and Gulf States; abundant. Our largest curculio, of which numerous varieties occur while immature, the most common variety has the elytra and thorax reddish-brown, with three black spots on elytra and one or more on thorax.

The larvæ bore in the roots and stocks of the Palmetto, in the latter part of June and July. When about to pupate, they construct an oblong cocoon, which consists of layers of fibres and excrement loosely woven together. These are invariably formed at the thickened basal part of leaves' stems, from which the imago issues in September and October. They do not seem to be attracted by the lamp, but on several occasions during the month of February, in the vicinity of New Orleans, I have observed large numbers flying among the Palmetto's, when they would produce a buzzing noise similar to *Copris carolina*. They seem most partial to the older and more injured plants, particularly those having been burnt. As many as sixty specimens have occurred in a single tree.

MICRO-LEPIDOPTERA.

BY V. T. CHAMBERS, COVINGTON, KENTUCKY.

Continued from Page 115

CYLLENE, *gen. nov.*

Anterior and posterior wings linear lanceolate, and apparently destitute of nervures. (In a single specimen of the hind wing, mounted as a microscopic specimen in Canada balsam, a short costal nervure, a subcostal and an independent nervure close along the posterior margin, but not beginning at the base, are visible, but ordinarily I can find no trace of any nervure except *perhaps* the costal is visible; to all ordinary observation the wings are without nervures.) The posterior are excised from the basal fourth of the costal margin to the apex. Size minute. The other generic characters are those of *Clymene (supra)*, and it is characterized like it by the erect or reversed hair-like scales. But it lacks the pale spots in the integuments of the wings, which characterize *Clymene*.

C. minutisimella. N. sp.

Vertex, palpi and abdomen silvery; face rather sordid white: antennæ dark griseous or fuscous, tipped with whitish; anterior wings brown mixed towards the base confusedly with silvery, with a distinct silvery spot on the costal margin, two others on the dorsal margin, one of which is just behind the middle and the other farther back: one at the apex and one on the costal margin opposite the space between the two dorsal ones. In some lights these spots are not distinct. Ciliæ and hind wings dark griseous.

Alar ex. scarcely exceeding 1/8 inch. It is therefore probably the smallest Lepidopteron known. Mr. Stainton, *Nat. Hist. Tin., v. 1*, says that *Nepticula microtheriella*, measuring 1 3/4 lines in *alar ex.*, was then the smallest. It is a shaggy and rather "uncanny" looking little moth. The larva is unknown. I have taken the imago abundantly in May and July at the lamp. But I find that I have but a single specimen left, for, as it is too small to pin successfully, I placed it in a tin "cell" on a microscope slide, covered by thin glass, held down by a rubber band, into which crept villainous little *Atropes* and ate all my little *Cyllene* save one.

NEPTICULA.

Nepticula miners of leaves of the Sycamore *(Platanus occidentalis.)*

Three species of *Nepticula* mine these leaves. Dr. Clemens describes these mines fully *(Proc. Ent. Soc. Phila., March, 1862)*. One of the mines is at first a slender track *filled with frass*. Afterwards the mine is expanded into a round blotch, almost obliterating the previous linear mine. This is the mine of

N. platanella Clem., *Proc. Ent. Soc. Phila, Jan'y, 1862.*

It may be distinguished from the two other species by having the wings shining dark brown, *with a silvery costal streak about the middle, and an opposite spot of the same hue on the dorsal margin.* For other particulars see Clemens' description. *Al. ex.* 3/12 inch. Kentucky.

The mine described by Dr. Clemens as No. 2 is linear, slightly enlarged towards its extremity, with the terminal portion enlarged into a small blotch just before the larva leaves it. *It has a central line of frass.* Dr. Clemens was not acquainted with the imago which I call

N. Clemensella. N. sp.

Palpi and face stramineous, tinged with rufous between the antennæ and eyes; eye-caps yellowish silvery. Antennæ pale fuscous. Primaries

bluish black, *with a minute ochreous spot on the extreme dorsal margin about the middle.* Viewed from the direction of the head there is a faint silvery streak visible opposite the ochreous spot, but it is not visible with the light in any other direction usually, although in one specimen it is visible *on one wing* in any light, but is not on the other. Ciliæ pale yellow, with a dark brown hinder marginal line near the base. *Al. ex.* $\frac{5}{32}$ inch. Kentucky; Pennsylvania.

The mine of the third species is at first crooked, with a *central line of frass.* It is afterwards enlarged, forming an irregular blotch, which covers all or nearly all of the original mine. It then resembles the mine of *N. platanella*, but is less rounded and the outline is more irregular. I have not succeeded in breeding this species, but have no doubt that the species described below as *N. maximella* is the maker of the mine.

N. maximella. N. sp.

Head and eye-caps yellowish white; palpi a little paler; antennæ dark fuscous above, whitish beneath; thorax and anterior wings bluish black, with a silvery white fascia about the middle, concave towards the base, and sometimes faintly interrupted in the middle. Apical ciliæ whitish, with a dark brown hinder marginal line near the base. *Al. ex.* $\frac{1}{4}$ inch. Kentucky.

Taken in large numbers resting on the trunk and leaves of Sycamore trees *(P. occidentalis)*, seldom elsewhere, and I believe it to be the miner No. 3.

N. serotinæella. N. sp.

Tuft rufous; face reddish yellow; palpi silvery gray; eye-caps and hinder portion of the vertex very pale or whitish golden; thorax and primaries blackish, with purple and bronzy reflections, the primaries crossed by two silver fasciæ, both of which are straight, the first being rather the widest, placed just before the middle, the second just before the beginning of the ciliae; cliae of the general hue, but in some lights silvery gray, the dorsal ciliae rather pale. *Al. ex.* $\frac{5}{32}$ inch. Kentucky.

The larva makes a very pretty mine on the leaves of the Wild Cherry *(Prunus serotina)*. The mine is narrow, linear, very much convoluted at first, filled with frass, which afterwards becomes a central line only in the mine, which is gradually a little widened; the mine is whitish and the frass black, but to the naked eye the mine appears brownish red, and

the leaf around it also becomes stained of that hue. The larva is bright green. Possibly this may be the *N. bifasciella* Clem., but I can discern no trace of green in the wings. Dr. Clemens gives no measurements and was not acquainted with the mine of *bifasciella*. He mentions, *Proc. Ent. Soc. Phila., Nov., 1861*, an empty mine in the leaves of the Wild Cherry as doubtfully that of a *Nepticula*, and possibly dipterous; and calls it *N.? prunifoliella*. As, however, he says that that mine begins in a blotch, and as he was not acquainted with the insect in any of its stages, and it often happens that two or three species mine leaves of the same plant, I have not deemed it expedient to adopt his name. The practice of naming species from an empty mine or even a larva, is a bad one, I think.

N. apici-albella. N. sp.

Palpi and eye-caps white; face reddish orange; antennae silvery, suffused with fuscous; thorax and primaries dark brown, slightly iridescent, suffused with purplish or golden, according to the light; just behind the middle of the wing is an oblique white fascia, which is nearest to the apex on the dorsal margin; ciliae of the general hue, except at the extreme apex, which is white. *Al. ex.* $\frac{5}{32}$ inch. Kentucky. Larva unknown. Imago in June.

N. minimella. N. sp.

Palpi white; face ochreous; eye-caps white; antennae light fuscous; primaries fuscous to the fascia, which is just immediately behind the middle, and *is convex both anteriorly and posteriorly;* purplish fuscous behind the fascia; apex whitish. *Al. ex.* less than two lines. Kentucky. At light in August.

N. thorace-albella. N. sp.

Palpi and eye-caps white; face reddish ochreous; antennae pale fuscous; thorax white, with a few scattered dark brown scales; primaries dark brown, with a curved white fascia about the middle, concave towards the base, and rather indistinct upon the costa. A white spot at the beginning of the costal ciliae, and an opposite dorsal one; ciliae of the general hue, except at the apex, where they are white. *Al. ex.* $\frac{1}{8}$ inch. Captured in June in Kentucky.

N. querci-castanella. N. sp.

Head, eye caps and palpi white, except a dark brown spot between the antennae on the head; antennae dark brown above, whitish beneath;

thorax and primaries yellowish ochreous, well dusted with dark brown; ciliae pale ochreous. *Al. ex.* $\frac{5}{32}$ inch. Kentucky.

The larva makes a somewhat crooked linear yellowish-white mine, with a central line of frass, in the leaves of the Chestnut Oak (*Quercus castanea*), in the latter part of July.

N. fusco-capitella. N. sp.

Head dark fuscous; palpi, eye-caps and antennae yellowish white, the antennae somewhat stained with fuscous above; primaries and thorax white, faintly tinged with yellowish, and the apical half of the primaries dusted with fuscous scales arranged mainly in small spots; body and legs creamy white. *Al. ex.* almost $\frac{1}{4}$ inch. Captured in Kentucky in June.

N. ochre-fasciella. N. sp.

Head and eye-caps pale reddish-ochreous; palpi a little paler; antennæ pale fuscous, with a silvery lustre; thorax and primaries blackish-brown, with a nearly straight yellowish-ochreous fascia just before the middle; apical ciliae yellowish-ochreous, basal half of the primaries yellowish-ochreous on the under surface. *Al. ex.* scarcely $\frac{1}{4}$ inch. Kentucky. Taken in June.

N. ciliæ-fuscella. N. sp.

Palpi silvery; head reddish-yellow; eye-caps silvery; thorax and fore-wings dark brown, a little bronzed, and cilliae of the same hue. A white fascia just behind the middle of the wing, nearly straight, a little widest on the dorsal margin, and *perhaps* a little nearer to the base on the costal margin; under surface and legs yellowish white; posterior tibiae fuscous. *Al. ex.* $\frac{5}{32}$ of an inch. Taken at lamp, Aug. 23rd.

I cannot see wherein this species differs from *fusco-tibiella* Clem., except that Clemens says "Ciliae pale grayish," whereas the ciliae in this species have the bronzy dark brown hue of the wings. Dr. Clemens gives no measurements.

INSECTS OF THE NORTHERN PARTS OF BRITISH AMERICA.

COMPILED BY THE EDITOR.

From Kirby's Fauna Boreali-Americana: Insecta.

(Continued from Page 117.)

305. DONACIA CUPRÆA *Kirby*.—Length of body 4½ lines. Taken in Canada by Dr. Bigsby [also on Lake Superior.]

[226.] Body above copper-coloured, glossy; underneath covered with a thick coat of decumbent pile of a cinereous colour, glittering in certain lights. Head downy, channelled; mouth and palpi rufous; mandibles and antennae black; prothorax rather wider than long, very minutely, thickly and confluently punctured and wrinkled; channelled, with a pair of impressions on each side, anterior tubercles not prominent; scutellum downy; elytra very grossly punctured in rows; a single anterior impression near the suture; truncated at the apex; three intermediate ventral segments of the abdomen have a yellow margin; legs obscurely rufous; thighs bronzed in the middle; posterior thighs with a minute tooth near the apex.

306. DONACIA HIRTICOLLIS *Kirby*.—Length of body 3½ lines. A single specimen taken in Lat. 65°.

Body underneath covered with a thick coat of decumbent pile resembling satin and shining like silver. Head hoary from inconspicuous hairs, most minutely and confluently punctured with a slight interocular channel with an obtuse ridge on each side; antennae with the second and third joints equal in length; labrum glittering with silver pile; prothorax longer than wide, hoary from inconspicuous down, most minutely and confluently punctured, channelled, sides subimpressed, anterior tubercles flat; scutellum large, levigated; elytra black, punctured in rows, whose interstices are wrinkled; posterior thighs with a single short obtusangular tooth.

This pretty species comes near *D. bidens* Oliv., which I always find on *Potamogeton natans*, but it is sufficiently distinguished by its black thorax hoary from down, and legs without any red.

[Synonymous with *D. rudicollis* Lac. Taken on Lake Superior.]

307. Donacia æqualis *Say.*—Length of body 4–4½ lines. Many taken in the journey from New York to Cumberland-house [also in Ontario.]

[227.] Body underneath covered with a thick coat of silver pile as in the preceding species. Head bronzed, hoary from cinereous down, minutely and confluently punctured, channelled between the eyes with a longitudinal obtuse ridge on each side the channel; antennae black, bronzed at the base, second and third joints equal in length; mouth piceous; prothorax bronzed and gilded, rather longer than wide, thickly and confluently punctured and wrinkled; channelled; sides longitudinally subimpressed; anterior tubercles obsolete; scutellum hoary from down; elytra bronzed, gilded, punctured in rows except at the apex where the punctures are confluent, two impressions adjoining the suture, and one in the middle of the base; apex truncated; ventral segments of the abdomen, the last excepted, with a bright orange margin; posterior thighs with a stout short tooth.

N. B. In the male the ventral segments are without the orange margin.

Variety B. Prothorax bright copper, elytra black-bronzed.

FAMILY HISPIDÆ.

308. Hispa *(Anoplitis)* bicolor *Oliv.*—Length of body 3¾ lines. Taken in Canada by Dr. Bigsby. Mr. Francillon had specimens from Georgia. Oliv.

[228.] Body linear, naked. Head black, smooth, channelled between the eyes; antennae robust, scarcely longer than the prothorax, black; eyes large, dark-brown; prothorax transverse, narrowest anteriorly, red, with four dusky spots placed transversely, grossly punctured, posterior angles producted, behind with a slight sinus on each side; space above the scutellum truncate; scutellum dull-red; elytra linear, black, three-ridged, with an abbreviated ridge towards the apex between the second and third; ridges elevated; interstices with a double series of large and very close punctures; between the second and third at the base and apex the series is quadruple, in the middle triple; lateral margin and apex serrulate; underside of the body blood-red; legs black, base of the thighs red.

FAMILY COCCINELLIDÆ.

309. COCCINELLA EPISCOPALIS *Kirby*.—Plate v, fig. 4. Length of body 2 lines. Taken in the journey from New York to Cumberland-house.

[229.] Body narrow, nearly linear, having at first sight the aspect of a *Haltica*, underneath black. Head black with three oblong pale yellow spots, two adjoining the eyes on their inner side, and one placed backwards in the vertex; mouth, antennae, and palpi rufous; prothorax and both elytra taken together, pale yellow with two black stripes, common to both, resembling a bishop's crosier, the crook being on the thorax and the stalk on the elytra: suture of the latter black except at the tip; legs pale testaceous; anus, sides of the abdomen, and tips of the ventral segment, except the basal one, pale.

[Belongs to *Nœmia* Muls.]

310. COCCINELLA TREDECIM-PUNCTATA *Linn.*—Length of body 3 lines. Several specimens taken in Lat. 54°.

Body oblong, black, lightly and minutely punctured; underneath slightly downy. Mouth and its organs pale rufous; nose white, whiteness with a posterior central lobe; antennae rufous; prothorax white with a large discoidal spot falling short of the anterior margin, where it is truncated; sides lobed, besides which there is a black dot on each side connected with the above spot; elytra reddish-yellow with six largish black dots, namely 1, 2, 2, 1, and one at the scutellum common to both elytra; the first marginal dot is ovate, the rest approaching to round; the tibiae and tarsi are testaceous; there are two transverse white spots on each side the breast, between the four posterior legs; and four triangular pale ones on each side the abdomen.

VARIETY B. Nose rufous, with a parallegramniscal white spot between the antennae.

[Belongs to *Hippodamia* Muls.; very common in Canada.]

311. COCCINELLA TRIDENS *Kirby*.—Length of body 2¼ lines. Two specimens taken in the Expedition.

[230.] Body rather oblong, very minutely punctured; black underneath, with two distant white spots on the breast, and three contiguous ones on each side of the abdomen. Head black with a transverse white band or trident between the eyes, tricuspidate both anteriorly and

posteriorly; the intermediate posterior lobe the longest; prothorax white with a large bipartite black spot, each lobe being trilobed with rounded lobes resembling a trefoil leaf and connected with the other by a transverse band; elytra pale reddish-yellow; with three black spots and one at the scutellum common to both elytra, placed 2, 1, 1; the scutellar spot somewhat bell-shaped, the humeral one roundish, the intermediate one nearly kidney-shaped, and that nearest the apex rather crescent-shaped.

Variety B. Frontal band replaced by three white spots, the intermediate the longest and linear.

LIST OF COLEOPTERA OF ST. LOUIS COUNTY, MISSOURI.

BY S. V. SUMMERS, M. D., NEW ORLEANS, LA.

The following list has been prepared to enumerate all the known Coleoptera—not new—found in Southern Missouri, collected on a line between St. Louis and Sedalia during the summers of 1869, '70, '71, and '72. The families Curculionidæ and Cerambycidæ are omitted in this list.

CICINDELIDÆ.

Tetracha, *Westw.*
- carolina, *Linn.*
- virginica, *Linn.*

Cicindela, *Linn.*
- sexguttata, *Fab.*
- purpurea, *Oliv.*
- splendida, *Hentz.*
- var. audubonii, *Lec.*
- generosa, *Dej.*

Cicindela, *Linn. (continued.)*
- vulgaris, *Say.*
- repanda, *Dej.*
- var. 12-guttata, *Chaud.*
- hirticollis, *Say.*
- cuprascens, *Lec.*
- macra, *Lec.*
- lepida, *Dej.*
- punctulata, *Fab.*

CARABIDÆ.

Omophron, *Latr.*
- tesselatum, *Say.*
- americanum, *Dej.*
- nitidulum, *Lec.*

Elaphrus, *Fab.*
- clairvillei, *Kirby.*
- ruscarius, *Say.*

NOTIOPHILUS, *Dum.*
sibiricus, *Motsch.*
NEBRIA, *Latr.*
pallipes, *Say.*
CALOSOMA, *Fab.*
externum, *Say.*
scrutator, *Fab.*
Wilcoxi, *Lec.*
frigidum, *Lec.*
Sayi, *Dej.*
calidum, *Fab.*
CYCHRUS, *Fab.*
lecontei, *Dej.*
elevatus, *Fab.*
PASIMACHUS, *Bon.*
elongatus, *Lec.*
punctulatus, *Fab.*
SCARITES, *Fab.*
substriatus, *Hald.*
subterraneus, *Fab.*
DYSCHIRIUS, *Bon.*
globulosus, *Say.*
sphæricollis, *Say.*
truncatus, *Lec.*
sellatus, *Lec.*
ARDISTOMIS, *Putz.*
viridis, *Say.*
ASPIDOGLOSSA, *Putz.*
subangulata, *Lec.*
CLIVINA, *Latr.*
corvina, *Putz.*
cordata, *Putz.*
ferrea, *Lec.*
bipustulata, *Fab.*
SCHIZOGENIUS, *Putz.*
ferruginea, *Putz.*
amphibius, *Hald.*
BRACHINUS, *Weber.*
tomentarius, *Lec.*
alternans, *Dej.*
strenuus, *Lec.*
perplexus, *Dej.*
americanus, *Lec.*
ballistarius, *Lec.*
fumans, *Fab.*
cordicollis, *Dej.*
medius, *Lec.*
lateralis, *Dej.*
distinguendus, *Chaud.*
patruelis, *Lec.*
rejectus, *Lec.*
pumilo, *Lec.*
PANAGAEUS, *Latr.*
fasciatus, *Say.*
MORIO, *Latr.*
georgiae, *Beaur.*
HELLUOMORPHA, *Lap.*
laticornis, *Dej.*
GALERITA, *Fab.*
atripes, *Lec.*
janus, *Fab.*
lecontei, *Dej.*
bicolor, *Drury.*
ZUPHIUM, *Latr.*
americanum, *Dej.*
CASNONIA, *Latr.*
pennsylvanica, *Linn.*
LEPTOTRACHELUS, *Latr.*
dorsalis, *Fabr.*
PLOCHIONUS, *Dej.*
bonfilsii, *Dej.*
LEBIA, *Latr.*
grandis, *Hentz.*
atriventris, *Say.*

LEBIA, *Latyr. (continued.)*
pumila, *Dej.*
furcata, *Lec.*
scapularis, *Dej.*
vittata, *Fab.*
lobulata, *Lec.*
pulchella, *Dej.*
bivittata, *Fab.*
viridipennis, *Dej.*
marginicollis, *Dej.*
var. affinis, *Dej.*
viridis, *Say.*
var. moesta, *Lec.*
ornata, *Say.*
TETRAGONODERUS.
fasciatus, *Hald.*
BLECHRUS, *Motsch.*
linearis, *Sch.*
AXINOPALPUS, *Lec.*
biplagiatus, *Dej.*
GLYCIA, *Chaud.*
purpurea, *Say.*
CYMINDIS, *Latr.*
americana, *Dej.*
pilosa, *Say.*
CALLIDA, *Dej.*
punctata, *Lec.*
CALATHUS, *Bon.*
gregarius, *Say.*
opaculus, *Lec.*
impunctata, *Say.*
PLATYNUS, *Bon.*
marginatus, *Chaud.*
pusillus, *Lec.*
sinuatus, *Dej.*
extensicollis, *Say.*
decorus, *Say.*
cupripennis, *Say.*

PLATYNUS, *Bon. (continued.)*
punctiformis, *Say.*
limbatus, *Say.*
crenistriatus, *Lec.*
pectinicornis, *Newm.*
crenulatus, *Lec.*
lutulentus, *Lec.*
octopunctatus, *Fab.*
OLISTHOPUS, *Dej.*
parmatus, *Say.*
micans, *Lec.*
LOXANDRUS, *Lec.*
erraticus, *Dej.*
minor, *Chaud.*
taeniatus, *Lec.*
EVARTHRUS, *Lec.*
seximpressus, *Lec.*
obsoletus, *Say.*
incisus, *Lec.*
substriatus, *Lec.*
colossus, *Lec.*
orbatus, *Newm.*
var. sodalis, *Lec.*
PTEROSTICHUS, *Bon.*
chalcites, *Say.*
lucublandus, *Say.*
var. fraternus, *Say.*
var. castanipes, *Kirby.*
var. dilatatus, *Lec.*
coracinus, *Newm.*
erythropus, *Dej.*
caudicalis, *Say.*
disidiosus, *Lec.*
femoralis, *Kirby.*
stygicus, *Say.*
permundus, *Say.*
LOPHOGLOSSUS, *Lec.*
haldemani, *Lec.*

(To be Continued.)

CORRESPONDENCE.

To the Editor:

Sir,—Your notice of "The Bulletin of the Buffalo Society of Natural Sciences," edited, I believe, by Mr. Grote, reminds me that I have a duty to perform.

Mr. Grote has, I am told, named and described a new *Sesia* in the Bulletin (*Sesia marginalis* I think is the name.) To this insect Mr. Grote has no sort of right of any kind, nor had he any right to name or describe it.

It was, as I am informed, simply sent to him by my friend, Mr. Strecker, for the purpose of obtaining his opinion as to whether it was a new species or not, and as it was consigned to Mr. Strecker by me for the express purpose of having it described and figured in his new work now being issued, I must protest against Mr. Grote's action in this matter, and trust that Entomologists generally will mark their disapprobation of this grab game by ignoring altogether Mr. Grote's very unbecoming action in the premises.

W. V. Andrews.

P. S.—I shall send the insect to Europe for description, &c., with an explanation of the circumstances.

New York, Aug. 1, 1873.

Note by Ed.—We really are unable to sympathize with our correspondent in his grievance. If he has ever done anything in descriptive Entomology he must know what an immense amount of labour is oftentimes involved in the effort to ascertain whether a particular insect has been described before or not. Unless one is thoroughly conversant, by dint of hard study and research, with the group or family to which an insect belongs, one must spend hours of work in hunting through, not only the descriptions of American Entomologists, but also the French, German and Latin, as well as English descriptions of European authors. After all this has been done and one arrives at the conclusion that the insect in question is new to science, it does seem a little hard that the labourer should be required to hand over the results to some one else who has not the ability or the industry to perform the work himself, and to allow him to reap all the credit that may be attached to the publication

of a new specific name. Surely Mr. Andrews is expecting Mr. Grote to do a little too much when he allows him to perform all this labour in identifying a particular species of *Sesia*, and then proposes that some one else should publish the results!

After all, however, it seems to us a very great misfortune that so much importance—so much glory, in fact—is supposed to be acquired by a naturalist by the mere giving a new name to an insect, and the appending of his own to it. Were this kind of renown less sought after—were there more generally diffused amongst us a humble desire to benefit science and increase the sum of human knowledge—we should not be oppressed with such a burden of synonyms as Entomology now groans under—infinite labour would be spared to the conscientious student,—dire confusion and distraction would not so often await the efforts of the pains taking observer.

ECONOMICAL ENTOMOLOGY.

BY PROFESSOR BELL, OF BELLEVILLE.

It is distinctly within my knowledge that many persons who are not overburdened with too large a share of worldly wealth, are strongly inclined to make the study of Entomology and the collecting of insect specimens an employment for their leisure hours, were it not for fear of the expense they believe it necessary to incur for cabinet, cork, pins, &c. Now, the cabinet and cork may be dispensed with—in fact, I have neither the one nor the other myself. I keep my collection in boxes, nineteen by twenty-four inches, outside size, of three-fourth inch pine board planed down to about five-eighth inch, by two and a quarter inches deep; the backs are made of clean basswood planed smooth, and half an inch thick, nailed on to the sides. On the upper edge of the two sides and on one end I fix a slip of thin pine, so as to leave eighteen and an eighth inches clear between the edges, and about one eighth for a groove at the bottom. Over each of these I nail firmly a slip of pine a quarter of an inch thick and a little wider than the thickness of the sides, so as to project over the inside slightly. This forms a groove for a light of glass eighteen by twenty-four inches to slide in, and the groove at the bottom receives the lower edge. The top is left open and the upper edge of the

glass projects about a quarter of an inch above the frame, which is convenient for drawing it out by. The inside is then lined out with paper such as newspapers are printed on, a stout picture-ring is screwed into the *side* at the top, and the box hangs like a picture against the wall.

I find that the Basswood, with a little care in putting in the pins, answers as well as cork; but if a softer substance is thought desirable, take a Basswood log and cut it into slices, about three-eighths of an inch thick, *across the grain*, making the boxes a quarter of an inch deeper and lining the backs with this, previously smoothed with a sharp plane. This is an excellent substitute; in fact I prefer it to cork, as it is free from the hard nodules which often have caused me to bend a pin and spoil a valuable specimen, and it never corrodes the wire, which the acid developed in the cork often does.

Some of my younger friends have adopted this plan, and look with pardonable pride on the adornment of their walls by these cases, which they have coloured and varnished, and which they declare are far superior to any pictures they could afford to buy.

MISCELLANEOUS.

PYRRHARCTIA (*Spilosoma*) ISABELLA.—Under this heading, in the April, '73 No. of the CANADIAN ENTOMOLOGIST, we have from the pen of Mr. Wm. Saunders, a brief history of the habits and metamorphoses of this insect. My experience with the larvae of this moth has been that some individuals at least *are* somewhat particular as to their diet, many rejecting clover and preferring the early shoots of June grass, others persistently refusing the latter and greedily devouring the former, others still ignoring both in their anxiety for some possibly more palatable article of food. Omnivorous they certainly are, but sometimes decidedly finical. Mr. S. states that they are "*probably* subject to the attacks of ichneumons." I have this spring bred from cocoons of *Pyrrharctia Isabella* two parasites, which have been kindly identified for me by Prof. Riley as *Ichneumon signatipes*, Cresson; and *Trogus obsidianator*, Brulle.

I may add as a noticeable fact that I have this morning pinned a brood of *Cryptus nuncius*, Say, bred from cocoon of *Platysamia cecropia*, numbering 21 ♂ and 19 ♀, neither sex, in this instance at least, being remarkably predominant.—O. S. Westcott, Chicago, July 12, 1873.

Phylloxera.—A very important paper has been printed by Government, respecting the *Phylloxera vastatrix*, or new Vine Scourge. It commences with a letter from Sir C. Murray, H. M. Ambassador at Lisbon, calling attention to the ravages of the disease; and stating that the Portuguese Government has named a Commission "to examine into the progress of this dangerous evil, and to gather from all quarters, whether scientific or practical *(sic)* suggestions for the best mode of extirpating it." A report follows from Mr. Crawford, H. M. Consul at Oporto, on the scientific aspects of the disease, as well as several others from French authorities, including a very important one addressed to the Minister of Agriculture and Commerce by the Commission instituted for the study of the new disease, M. Dumas, president. The various papers having been referred to Dr. Hooker for him to report upon them, he states that the only really effectual remedy at present discovered, and this can obviously be only very partially applied and not in the best districts, is flooding the vineyards in winter. He adds: "there is reason to believe that on the first symptoms of attack in isolated cases, the prompt destruction of the vine, its burning on the spot, and the subsequent treatment of the soil with some approved insecticide, such as carbolic acid, would be of great importance." Vines of American species appear at present to have enjoyed immunity from its ravages in the Rhone district, but the disease has undoubtedly appeared in this country on vines cultivated under glass.—*Nature.*

Exchanges.—As I have occupied myself for some time with Entomology, and have in my collection a good number of duplicates of insects in all the orders, I am ready to make exchanges with any of the correspondents of the Can. Ent. I am in especial want of Neuroptera. As I spend the summer in the collection of insects, I believe that I am in a position to make numerous exchanges.—F. X. Belanger, Naturaliste, Universite Laval, Quebec.

Exchanges.—I am much in want of a Canadian correspondent in Lepidoptera. I may say that every Canadian insect is a desideratum to me, for I have not a series of good specimens of any species. I have many, of course, but not a complete series, and there is not a butterfly

which I should not be glad of, even to *Pieris oleracea*, *Grapta faunus*, and *Danais chrysippus*. Thus even the commonest species would be very acceptable. My plan is to send a large box from Liverpool once a year, instead of smaller ones, though I occasionally forward lesser ones by post. Address :—Dr. Jordan, 35 Harborne Road, Edgbaston, Birmingham, England. [We take this opportunity of thanking Dr. Jordan for the little box, containing 46 species of beautiful English Lepidoptera, that he so kindly sent us. They came by post, and, thanks to careful packing, arrived in excellent order. As soon as we obtain a little leisure we shall return the box—not empty.—Ed. C. E.]

Pieris rapæ.—This destructive pest of the cabbage and allied plants has now come as far west as Port Hope ; it is almost as abundant in our garden as the common *Colias philodice*. No doubt it will proceed as far as Toronto before the close of the season. We have not yet perceived any particular depredation from its larvæ in the kitchen garden, but we fear that we shall not long enjoy this immunity.—C. J. S. B.

Sembling.—On the 19th of June last a fine female Cecropia Emperor moth issued from its cocoon, which had been cut from an apple tree and kept in my study for some weeks. Being anxious to try the virtues of the process of "sembling," I fastened its wings by an ordinary spring clip and exposed it on my verandah for several nights without success ; the evenings were fine and cool. On the 28th, the evening being warm and misty after a shower, the moth was exposed as usual on an empty flower-stand, just outside of an open window ; inside the room on a table a lamp was kept burning. About 11 o'clock, p. m., I entered the room and observed nothing but a few ordinary Noctuae flying about ; on returning, however, an hour later, I was amazed to find four splendid specimens of the male Cecropia quietly at rest upon the table and lamp ; a few moments after a fifth came in and flew wildly about the room, succeeded in a little while by a sixth ! They were all in excellent order and evidently fresh from their cocoons. As I had kept the female so long in confinement, I determined not to continue the experiment any longer ; I accordingly dispatched five of the males with chloroform, while the sixth was left with the object of his attraction. The result was a large batch of eggs and subsequent larvae. As the female was entirely hidden from view underneath the window, and was not found by the males, who entered the room to the light instead, flying but a short distance over the fair one of whom they were in search, it is evident that they were guided to the

spot by the sense of smell and not by sight. The light in the room could not have been the primary attraction, as it was so obscured by a trellis covered with creepers as to be hidden from view a few yards off.

Not long after I tried the same experiment with a female *Promethea*, but with no success whatever, though the evenings were often favourable. This failure I attributed to the scarcity of its food plants in the immediate neighbourhood (its cocoon was brought from a considerable distance),and the consequent absence of males within reach of the females' attractive powers.—C. J. S. B.

Noxious Insects.—The Hessian-fly *(Cecidomyia destructor)* has made its appearance in the neighbourhood of London, Ont., and has done a great deal of injury to the spring wheat. The Colorado beetle (*Doryphora decem-lineata*) is very abundant throughout Western Ontario, but, we are happy to say, is being well kept down by the intelligent farmers of that district, who wage an exterminating war upon it with Paris Green. In its eastern progress it has nearly traversed the whole Province of Ontario, but not yet in sufficient numbers to occasion much diminution of the potato crop. To the south-east we learn that it has invaded Maryland and Pennsylvania. In the neighbourhood of London and Guelph, Ont., we observe, with great regret, that the Locust trees are being rapidly destroyed by the ravages of the borer (*Arhopalus robiniæ*, Forster). Young Apple and Mountain Ash trees are also suffering grievously from the attacks of the Buprestis borer (*Chrysobothris femorata*, Fabr.) About Port Hope, Ont., this summer, the Forest and American Tent caterpillars (*Clisiocampa sylvatica* and *Americana*) have been more than usually numerous and destructive.—C. J. S. B.

ADVERTISEMENTS.

Exchange.—I am desirous to exchange English for Canadian or American Lepidoptera. J. C. Wasserman, Beverly Terrace, Cullercoats, North Shields, England.

Coleoptera for Sale.—A number of Rocky Mountain Coleoptera will soon be for sale in sets by John Akhurst, 19, Prospect Street, Brooklyn, N. Y.

The Canadian Entomologist.

VOL. V. LONDON, ONT., AUGUST, 1873. No.8

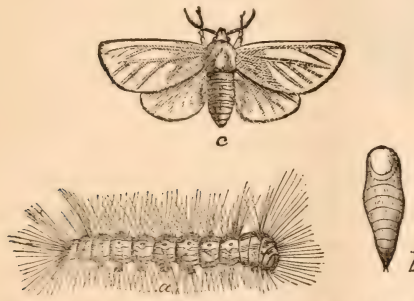
ON SOME OF OUR COMMON INSECTS.

7. *THE FALL WEB-WORM—Hyphantria textor*, Harris.

BY THE EDITOR.

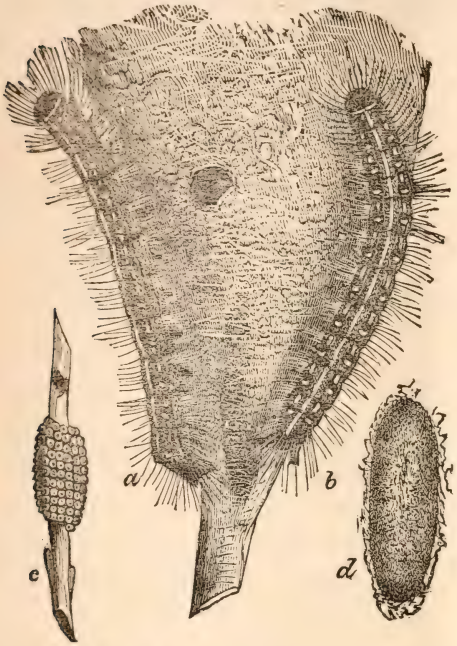
Though extremely abundant and very destructive throughout the whole of this Province, and in the neighboring Northern and Middle States, this insect (fig. 16) is very commonly confounded with the equally abundant and noxious Tent Caterpillars (*Clisiocampa Americana* and *Sylvatica*, Harris) see fig. 17. This confusion arises solely from the fact that all three species spin large webs upon the trees they infest, and therefore, without further observation, it is taken for granted that they are one and the same. We feel no surprise at a mistake being made between the two species of Tent Caterpillars, as they closely resemble each other in many respects; but the Fall Web-worm differs from both in almost every particular. For instance, the former are hatched from the egg-bracelets very early in the spring before the apple leaves are fully expanded, and very soon spin in the fork of a limb, or upon the side of the trunk, their thick, silvery white, cobweb-like 'tent;' the latter do not appear till the month of August, when they form a loosely-woven, dirty-coloured web over the end of a bough. Were the web and the 'tent' at once upon the same tree there would be no difficulty in distinguishing between them, but few bear

Fig. 16.



in mind the differences when the one follows the other. Again, the eggs of the Tent Caterpillar are deposited in bracelets of two or three hundred on the twigs of the trees about midsummer, but do not hatch out till the following spring; those of the Web-worm are deposited in little clusters upon the leaves about the middle of June, and hatch out early in August.—The Tent Caterpillars, when fully grown, are over an inch and a half in length, covered with sparse hairs, blackish in colour, ornamented with blue and with either a white stripe or a series of white spots along the back; the Web-worm is much smaller, more hairy, in general colour varying from black to blue and greenish and with a broad blackish stripe along the back. Further, the moths produced from the former belong to the family Bombycidæ, and are of a rusty red or pale brownish colour, with the fore wings crossed in the one species with two pale lines, in the other with two dark ones; the moths of the latter belong to the family Arctiidæ, and are of a pure white colour, free from any markings whatever upon the wings. Lastly, the former pass the winter in the egg; the latter in the pupa state.

Fig. 17.



Having now related the principal characteristics that distinguish *H. textor* from our two species of *Clisiocampa*, it is unnecessary to give any further description of the insect, any indefiniteness being done away with, we trust, by the illustrations prefixed to this paper.

The Fall Web-worm feeds upon the leaves of a great many kinds of trees, few indeed—except the evergreens—appearing to come amiss to it. It seems to be especially fond of the Wild Cherry, Hickory, Ash, Elm, Willow, Apple, Oak, Birch and Button-wood.

The best, and indeed the only feasible remedy for the ravages of this insect is to cut off and burn, or carefully tread under foot, the whole portion of a branch that is covered with the web. As the worms feed always beneath their web, and do not wander over the tree like the Tent Caterpillars, this method of dealing with them is a sure one. Where it is unadvisable to cut off the branch, as may sometimes be the case with young or dwarf fruit trees, the insect may be got rid of by simply drawing the infested leaves through the hand and crushing the caterpillars upon them.

ON MR. SCUDDER'S SYSTEMATIC REVISION OF SOME NEW ENGLAND BUTTERFLIES.

[3RD PAPER.]

Continued from Page 63.

BY A. R. GROTE, CURATOR BUFFALO SOCIETY NATURAL SCIENCES.

6. DANAIS, *Latr.*—It is objected that our species is generally known as *archippus*, to the restitution of the name *plexippus*, given by Linn. to our common species. It is much better to alter a label than to perpetuate an error.

7. BASILARCLIA, *Scudd.*—Together with sixty-eight specimens of *arthemis*, Mr. Chas. Linden took six *proserpina* near Buffalo, N. Y. The material before me makes me feel sure that Mr. Scudder is wrong in referring Edwards' species as a synonym of *ursula*. Traces of the white band and the general size make me suggest that we have possibly to do with a race of *arthemis*. But as yet we must catalogue *proserpina* as distinct. We have a reasonable excuse for preferring *ursula* as the trivial name for our common species. To this genus we must refer *L. weidemeyerii*.

8. DOX-OCOPA, *Hubn.*—It is not disputed, or at least should not be, that we have no true *Apatura* known from the Atlantic district.

9. GRAPTA, *Kirby.*—The retention of Kirby's term is defensible on general grounds.

10. NYMPHALIS, *Latr.* 11. PAPILIO, *Linn.*, restr. *Scudd.*—Schrank's limitation of the term originally used for all the butterflies by Linn. is referred to by Latreille, Insecta Pterodicera, p. 198, where *vanessa* is

considered as the equivalent. I believe that Fabricius' use of the term *Papilio* will not allow us to follow Mr. Scudder's. I remain of the opinion that the older writers before Schrank sufficiently expressed their ideas as to the typical section of the genus, and that the term should be used for a genus of which the European *P. machaon* is the type. As we cannot use *Eugonia*, Hubn., of which *angelica*, Cramer, is the type, I propose the term *Scudderia* for the *Pap. antiopa* of Linnæus.

12. Aglais *Dalm.*—This I think we may adopt without hesitation and be thankful for the pretty name.

13. Vanessa, *Fabr.* 14. Junonia, *Hubn.* 15. Euptoieta, *Doubl.*—The values of these terms have not been altered. The seven genera among which our frittillaries are divided, I think we must agree are tenable. To *Euphydryas* I refer *Melitæa chalcedon*, Boisd., from California.

23. Libythea, *Fabr.*—We are unfeignedly glad Kirtland's term is retained and that we are not to be vexed by another of Boisduval and Leconte's unfulfilled intentions.

24. Calephelis, *G. & R.*—Mr. Scudder uses erroneously *Polystichtis*. In the *Verzeichniss*, Hubner identifies with an exclamation mark *Papilio fatima*, Cram., 271, A. B., and regards this as the type of *Polystichtis*. It is from Surinam. Our two species from the Atlantic District are generically distinct from the S. American forms. Hubner considers that "*Pap. cereus*" of Linn. is this species of Cramer's, and prefers that name, but this identification may not be correct. Retain *Polystichtis* for the S. American forms, but there is no excuse for stating that "*Papilio cœnius*" is the "type" of *Polystichtis*. We were familiar with Hubner some time ago. We doubt that Linnæus intended our *N. pumila* under his "*cereus*," "*cerea*," or "*cœnius*." We propose to designate our two species as *Cal. pumila* and *C. borealis*.

So far as we have proceeded some few generic changes seem impossible to be avoided. Many of Hubner's genera are excellently well limited (e. g. Nisoniades), even according to our present views. Perhaps it is not hazarding too much to say that his genera are not in the present state of science, more incongruous than those of any one author of or before his time. It is difficult to say on what plea we shall ignore him. The prejudice has been strong that has hitherto neglected him.

As we must adopt *Oeneis*, Hubner, we propose the term *Callœneis* as

a substitute for Mulsant's synchronic term. *C. pusilla* is from Nebraska.

Hubner's subsequent use of the term *Eugonia* in the Phalaenidæ cannot be defended. I propose the term *Eriplatymetra* for our *E. coloradaria* and the European *E. angularia.*

LIST OF COLEOPTERA OF ST. LOUIS COUNTY, MISSOURI.

BY S. V. SUMMERS, M. D., NEW ORLEANS, LA.

(Continued from Page 134.)

CARABIDÆ.

LOPHOGLOSSUS, *Lec.* *(continued.)*
- strenuus, *Lec.*
- scrutator, *Lec.*

AMARA, *Bon.*
- avida, *Say.*
- lacustris, *Lec.*
- angustata, *Say.*
- impuncticollis, *Say.*
- fallax, *Lec.*
- obesa, *Say.*
- musculus, *Lec.*
- chalcea, *Dej.*

BADISTER, *Clair.*
- notatus, *Hald.*
- pulchellus, *Lec.*
- ferrugineus, *Dej.*

DIPLOCHILA, *Bru.*
- laticollis, *Lec.*
- major, *Lec.*
- impressicollis, *Dej.*
- obtusus, *Lec.*

DICÆLUS, *Bon.*
- dilatatus, *Say.*
- splendidus, *Say.*
- purpuratus, *Bon.*
- sculptilis, *Say.*
- ovalis, *Lec.*
- simplex, *Dej.*
- elongatus, *Dej.*

ANOMOGLOSSUS, *Chaud.*
- emarginatus, *Say.*
- pusillus, *Say.*

CHLÆNIUS, *Bon.*
- aestivus, *Say.*
- erythropus, *Germ.*
- fuscicornis, *Dej.*
- laticollis, *Say.*
- rufipes, *Dej.*
- sericeus, *Fors.*
- prasinus, *Dej.*
- chlorophanus, *Dej.*
- cordicollis, *Kirby.*
- nemoralis, *Say.*
- pensylvanicus, *Say.*
- tricolor, *Dej.*
- brevilabris, *Lec.*
- impunctifrons, *Say.*
- niger, *Rand.*

tomentosus, *Say.*
viduus, *Horn.*
lithophilus, *Say.*

ATRANUS, *Lec.*
pubescens, *Dej.*

ANATRICHIS, *Lec.*
minuta, *Dej.*

OODES, *Bon.*
fluvialis, *Lec.*
americanus, *Dej.*
amaroides, *Dej.*
cupræus, *Chaud.*

GEOPINUS, *Lec.*
incrassatus, *Dej.*

CRATACANTHUS, *Dej.*
dubius, *Beaur.*

AGONODERUS, *Dej.*
lineola, *Dej.*
comma, *Lec.*
pallipes, *Fabr.*
partarius, *Chaud.*

DISCODERUS, *Lec.*
parallelus, *Hald.*

ANISODACTYLUS, *Dej.*
rusticus, *Dej.*
carbonarius, *Say.*
harrisii, *Lec.*
melanopus, *Hald.*
nigrita, *Dej.*
discoideus *Dej.*
baltimorensis, *Say.*
laetus, *Dej.*
coenus, *Say.*
sericeus, *Harris.*

XESTONOTUS, *Lec.*
lugubris, *Dej.*

SPONGOPUS, *Lec.*
verticalis, *Lec.*

AMPHASIA, *Newm.*
interstitialis, *Say.*

EURYTRICHUS, *Lec.*
piceus, *Lec.*
terminatus, *Say.*

GYNANDROPUS, *Dej.*
hylacis, *Say.*

BRADYCELLUS, *Er.*
vulpeculus, *Say.*
badiipennis, *Hald.*
rupestris, *Say.*
tantellus, *Chaud.*

HARPALUS, *Latr.*
gagatinus, *Dej.*
dedicularius, *Dej.*
caliginosus, *Fab.*
testaceus, *Lec.*
erraticus, *Say.*
viridiæneus, *Beaur.*
faunus, *Say.*
pensylvanicus, *De Geer.*
compar, *Lec.*
erythropus, *Dej.*
pleuriticus, *Kirby.*
herbivagus, *Say.*
nitidulus, *Chaud.*
rufimanus, *Lec.*
vagans, *Lec.*

STENOLOPHUS, *Dej*
carbonarius, *Bru.*
fuliginosus, *Dej.*
conjunctus, *Say.*
ochropezus, *Say.*
dissimilis, *Dej.*

PATROBUS, *Dej.*
longicornis, *Say.*

BEMBIDIUM, *Er.*
paludosum, *St.*

inaequale, *Say.*
coxendix, *Say.*
nitidulum, *Dej.*
nitidum, *Kirby.*
americanum, *Dej.*
fugax, *Lec.*
cordatum, *Lec.*
dorsale, *Say.*
patruele, *Dej.*
pictum, *Lec.*
affine, *Say.*
texanum.
frontalis, *Lec.*
4-maculatum, *Linn.*
pedicellatum, *Lec.*
lævigatum, *Say.*

TACHYS, *Ziegl.*
proximus, *Say.*
scitulus, *Lec.*
corruscus, *Lec.*
lævus, *Say.*
nanus, *Gyll.*
flavicauda, *Say.*
capax, *Lec.*
xanthopus, *Dej.*
incurvus, *Say.*
pulchellus, *Ferte.*
dolosus, *Lec.*

PERICOMPSUS, *Lec.*
ephippiatus, *Say.*

(To be Continued.)

MICRO-LEPIDOPTERA.

BY V. T. CHAMBERS, COVINGTON, KENTUCKY.

Continued from Page 128.

CLYMENE and CYLLENE.

C. aegerfasciella, ante p. 114, and *C. minutisimella, ante p. 125.*

When the generic and specific characters of these insects were written —more than a year ago—I placed them, with much doubt, among the Micro-Lepidoptera. Subsequent examination has only served to increase those doubts, or rather, has convinced me that they are allied to the *Hydroptilidæ*, and are Trichopterous, if *Hydroptila* is Trichopterous. At the same time, it was partly because I was unable satisfactorily to place them in *Hydroptila*, or any allied genus heretofore described, that I was induced to place them among Micro-Lepidoptera. These minute species of supposed Trichopterous affinities are so little known; the characters of families, genera, and species are so vague; and so much confusion prevails about them, that I take the liberty of suggesting that the *Hydroptilidæ* are more Lepidopterous than Trichopterous or Neuropterous—at

least if these two species are true *Hydroptilidæ*. I am, however, no Trichopterist, and am not competent to decide the question. It seems to me, however, from an examination of such specimens as I have seen, and from such study as I have been able to give to Trichoptera, that they are more nearly allied, for instance, to *Tinea* than to *Phryganea*, that they do not differ from other *Tineina* more than other genera of that family differ from each other, and that they differ from other Trichoptera fully as much as they do from any *Tineina*. I speak only of the imago—for the larvæ of *Clymene* and *Cyllene* are unknown—Trichoptera, and especially *Hydroptila*, seems to me a very heterogeneous assemblage.

Referring the reader to the published accounts of *Clymene* and *Cyllene* on previous pages of this volume, I add the following notes as bearing on their Trichopterous affinities. :—

The most striking character of both species, and that which first suggested doubts of their Lepidopterous affinities, is the clothing. Both are clothed with short stiff or scale-like hairs, instead of true scales, of which I have not been able to denude the wings except by boiling in potash. Many of these hairs are reversed, looking as if brushed backwards ; and, in *Clymene* especially, the Patagia are comparatively naked and are clothed with rather long stiff hairs or bristles. I have found both species in the same localities in company with each other and with *Gelechia*, *Lithocolletis* and other true Lepidoptera, resting upon fences and trunks of trees, in the dryest situations to be found in this well watered region. Of *Cyllene* I have dissected both ♂ and ♀ ; of *Clymene* only the ♀. In both the antennæ are moniliform.

Cyllene.—Anterior tibia spurless ; intermediate ones with two apical spurs, one of which is small ; posterior with one long median spur, and two short apical ones, one of which is very short. Basal joint of the antennæ small ; ocelli none ; maxillary palpi 3 (or 4 ?) jointed (if four the basal one is very minute and indistinct), the last joint being slender and longer than either of the others. I was not able to detect the presence of labial palpi, even when the head was severed carefully from the body and boiled over the lamp on a glass slip under the thin glass cover. Anterior wings pointed ; posterior wings with the costa excised from before the middle to the tip ; cilia long.

Clymene.—Basal joint of the antennæ swollen ; ocelli none. In the diagnosis, ante p. 114, I have stated that there is no tongue. This is scarcely correct ; there is a minute, conical, fleshy protuberance which I

think is a rudimentary tongue, and on each side of it a smaller and more corneus projection, which I take to be the representatives of the maxillæ. Maxillary palpi three-jointed, the joints simple and of nearly equal length ; labial palpi small, simple, one (or two?) jointed (if two the basal one is minute and indistinct.) Anterior tibia without spurs ; intermediate tibia with one short median, and one short and one long apical spur ; posterior tibia with two median spurs, one of them small, and two rather long apical spurs.

The ciliæ, especially of the hind wings, are very long in both insects. The neuration is obsolete in *Cyllene;* in *Clymene* it resembles closely that of *Hydroptila tineoides* Dalman, as figured by McLachlan in *Trans. Ent. Soc. Lond., Ser. 3, v. 5, plate 5, fig. 7.* Indeed that of the forewings is almost identical, whilst the hind wings differ somewhat both in shape and neuration.

The specific description of *C. aegerfasciella* should be corrected by adding the statement that the hairs around the mouth are dark brown.

By comparing the above account of these insects with McLachlan's account of the family *Hydroptilida* and its two genera, *Agraylea* and *Hydroptila, loc. cit.*, the differences to which I have alluded will be observed.

BUCCULATRIX.

This genus is usually associated with *Lithocolletis* and allied genera ; but the fact that it is an external feeder, except for a very brief period ; the absence of palpi and tongue, and the different neuration of the wings seem to me to remove it from that association.

In addition to the points of structure just mentioned, a Bucculatrix has the basal joint of the antennae expanded, forming an eye-cap which almost conceals the eyes. The face is smooth and there is an erect tuft upon the vertex, and the antennae are nearly as long as the wings.

A—Species having a brownish spot on the dorsal margin of the anterior wings.

* Having an apical spot.

1. B. trifasciella, Clemens. *Proc. Ent. Soc. Phila., 1865, p. 147.*

Unknown to me except by Dr. Clemens' description. Wings ochreous with three silvery costal streaks.

2. B. capitealbella. N. sp.

Face and tuft snowy white; antennæ silvery white; anterior wings snowy white, with a few scattered ochreous brown scales about the middle of the basal half. Just before the middle is a pale yellowish costal streak passing obliquely backwards to the middle of the wing and widest on the costa, where it is dusted with brown. A similar but less oblique streak just behind the middle. On the dorsal margin, opposite the space between these streaks, is a rather large yellowish spot internally margined by a small raised patch of dark brown scales. On the base of the costal ciliae is a patch of pale yellowish dusted with brownish; a streak of the same hue around the base of the dorsal ciliae, containing a minute brown spot at the beginning of the ciliae and another at the apex of the wing. Ciliae white, flecked with brownish at the extreme tip.

Alar ex. a little over ¼ inch. A single specimen taken in Kentucky. Larva and food plant unknown.

3. B. pomifoliella, Clem. *Proc. Acad. Nat. Sci,, Phila., 1860, p. 211.*

This is our commonest species. It feeds on the leaves of Apple trees. Wings whitish dusted with brown. A brownish costal streak widest on the costa passes obliquely across the wing to the dorsal ciliae.

* * No apical spot.

4. B. obscurafascielia. N. sp.

Face yellowish white; tuft reddish orange, becoming almost rufous on top; antennae yellowish silvery, dotted with brown above; anterior wings pale golden at the base, deepening towards the apex, with two tolerably distinct but not well defined costal white spots or streaks before the middle, the first continuing as a very indistinct band obliquely across the wing and slightly angulated posteriorly near the dorsal margin, where it is bounded behind by a distinct dark brown spot containing raised scales. At near the apical third is an indistinct whitish fascia with a few dark brown scales before it on and near the costa. Ciliae pale stramineous. Apex and ciliae sparsely flecked with pale fuscous. A dark brown hinder marginal line in the ciliae. Under surface and legs yellowish silvery with the anterior surface of the tarsi annulate with fuscous. *Alar ex.* about ¼ inch. Larva and food plant unknown. Captured May 23rd.

Dr. Clemens' description of his *B. coronatella* seems to resemble this insect, except that he does not mention the dorsal spot and the 1st fascia is represented in that species by a costal and opposite dorsal spots.

5. B. luteella. N. sp.

Face, tuft and antennae white ; thorax and anterior wings pale creamy white suffused with pale orange, which in some places is condensed into blotches or bands ; sparsely dusted with pale fuscous, and with a very small patch of raised scales about the middle of the inner margin of the anterior wings. Ciliae stramineous. *Alar ex.* ¼ inch. Kentucky. Larva and food plant unknown. Captured in March.

6. B. agnella. Clem., *loc. cit.*

Wings whitish, washed with luteous brown, especially towards the tip. Costa dark fuscous from the base, giving off about the middle a short fuscous streak. Imago in May. Unknown to me except by Dr. Clemens' description.

B—No dorsal spot.

7. B. Packardella. N. sp.

Face and eye-caps white, lower portion of the face tinged with pale golden, sparsely flecked with pale brownish. Tuft white below, tipped above with yellowish and brownish. Antennae pale yellowish, dotted with brown. Thorax white, well dusted with brown, and *with a small brown spot on each side near the apex.* Wings, basal half white flecked with brown, faintly streaked with orange chrome upon the fold, and with a narrow line of the same along the costal margin flecked with brownish and widening towards the middle, whence it spreads over the apical half of the wing, which is a decided orange chrome, with a short, faint, narrow curved white streak running through it from the middle of the wing to the base of the dorsal ciliae, and a small oblique white streak about the middle of the apical portion of the wing, which is dusted with brownish along the costa, and in the ciliae forming an approach to two hinder marginal lines in the ciliae, which are yellowish stramineous. *Alar ex.* ¼ inch. Larva and food plant unknown. Taken in April.

8. B. coronatella, Clem. *Proc. Acad. Nat. Sci., Phila., 1860, p. 13.*

Unknown to me except from the description of Dr. Clemens. See *B. obscuro-fasciella, ante.*

9. *B. Thuiella?* Packard.

Unknown to me except from the figure in the "American Naturalist," v. 5, p. 427, which does not indicate a dorsal nor an apical spot, though Dr. Packard says that it resembles *B. pomifoliella*. I place it doubtfully in this section.

These, I believe, are the only described American species.

CORRESPONDENCE.

MONTRRAL, JULY 14TH, 1873.

DEAR SIR,—

I should like to be informed how to distinguish the sexes of moths and butterflies when there is no dissimilarity in the markings of the wings, &c.; also, how to distinguish *A. cybele* from *A. aphrodite*, and also to recognize *A. atlantis* and *A. montinus*, as in Harris they are not described at all, and Packard only mentions their names. I should also like to know how to preserve spiders and bugs, &c., in the best way.

Yours, &c.,
H. H. L., Montreal, P. Q.

In the larger moths the sexes may be distinguished frequently by the structure of the antennæ, they being more widely pectinate in the male than in the female. Where no distinguishing features of this kind present themselves, the relative size of the bodies will enable one to decide this matter, the bodies of the females being usually distended with eggs. A more accurate method would be to examine the character of the generative organs, for the structure of which we would refer our correspondent to Packard's Guide, p. 16, 170, 237.

In answer to the queries relating to *cybele*, *aphrodite* and *atlantis*, we quote the following from that excellent work of Mr. W. H. Edwards': "The Butterflies of North America":—

"Cybele is the larger, and the difference in color between the sexes is much less than in Aphrodite. In the latter the male is much smaller in proportion to the female, is brighter colored than Cybele, and has very little brown at base of wings. The black markings are noticeably more

delicate, the marginal lines on primaries nearer together, more or less excluding the fulvous spots which, in Cybele, are distinct along the whole margin. The margin of secondaries also has an edge line like the primaries; the median band is formed of small crescents, separated by wide spaces and obsolete on costal margin; and there is no black space between the costal and subcostal as in Cybele. On the under side the silver marginal and costal spots are decided, while in Cybele they are usually wanting, or indicated by a few scales only; the basal color of secondaries is cinnamon-brown, and the band is more or less encroached on by the ground color; the pyriform spot of third row is cut by the arc as in Cybele, but the smaller spot thus made is edged above with black and is in effect a distinct spot. Comparing the females, Cybele is luteous, very dark at base, heavily marked with black. Aphrodite is suffused with a rich red tint that seems as if in the very texture of the wing, and that makes living specimens conspicuous; the under side of primaries is red fulvous, of secondaries deep ferruginous, and the band is almost wholly crowded out."

"Atlantis is readily distinguished from Aphrodite by its smaller size, duller color, broad black margins, confluent median band of secondaries and color of same wings below; also by the longer and narrower fore wings."

Spiders may be preserved in diluted alcohol in bottles. Bugs *(Hemiptera)* are pinned in the usual way.

We received from our esteemed correspondent, W. H. Edwards, Esq., a few days since, a letter in which he informed us that he had received from Labrador, from Mr. Wm. Couper, specimens of a Papilio which has already been several times referred to in our journal. With the writer's consent we have much pleasure in inserting the following note, which has just come to hand.—Ed. C. E.

Coalburgh, W. Va., 24th Aug., 1873.

Dear Sir,—

I have taken the Papilio's from Anticosti from drying blocks, and have compared with all the allied species that I had with me; also, have compared with the description of Brevicauda, Saunders, and I have no doubt that the species is a good one and its name is Brevicauda. It is allied to Zolicaon and Machaon.

But the above is seen to differ in this, that the hind wings are black from base to yellow band beyond the cell, while in all the others named the color of that section of the wing is yellow. Also, the body is black spotted with yellow, in longitudinal lines, as in Asterias, while in the before named species the wings are black with yellow stripes, not spots There are other differences, but these are enough to mention.

The yellow spots of Brevicauda are replaced with fulvous to a remarkable extent, but that peculiarity is not unusual in the group, nor in the Asterias group. These specimens from Anticosti differ greatly in this respect, though in all I have seen the fulvous is confined to the lower side. They also differ in length of tail, though the longest is short compared with the average Asterias. Yours truly,

W. H. Edwards.

MISCELLANEOUS.

Tent Caterpillars *(Clisiocampa).*—These pests were very numerous here this season, swarming on the trees of both orchard and forest. I observed one Thorn tree on Montreal Mountain that had been completely stripped of its leaves by them, leaving nothing but a few old webs that one might fancy were banners left to mark the path of a victorious army. A little farther on I found another horde encamped upon two Thorn trees that were growing one on each side of a large rock; not finding the leaves of the tree on which their parent had placed them to their taste, they made a path across the rock to the tree at the other side, and upon which they climbed by two or three leaves that rested against the edge of the rock. Now, if it had not been for the leaves touching the rock the caterpillars would have had to crawl down one tree and up the other whenever they needed food, and their instinct seemed to have taught them so, for although the whole nestful of hungry caterpillars crossed the leaves every time they went to feed, not one of them attempted to eat their bridge, but passed farther on before commencing their meal. In former seasons any of these caterpillars that I observed spinning up, chose the shelter of a fence or crevices in bark or some such place to make their cocoons in, but this season I found them rolling up leaves and making their cocoons inside them, and in some cases I found two cocoons in the same leaf. I found them spun up in almost every kind of leaf, Linden,

Oak, Maple, Butternut, Thorn, Sweet Briar, Asclepias, Fern, &c. On Asclepias and Fern they only rolled one edge of the leaf, and sometimes spun up on the leaf exposed without any covering. I also found several spun between stalks of grass, indeed they selected some most extraordinary places, for a friend of mine showed me one in a bird's nest. The nest was built in a Fir tree and contained four eggs, over which the cocoon was spun and attached firmly to the sides of the nest; it would not have been so strange if the nest had been on any of its food plants and built low down, but this was on a Fir tree and a good highth from the ground. I suppose it may be set down as one of the freaks of Nature. I selected cocoons from leaves of various trees and plants, and all of them proved to be *Clisiocampa sylvatica*, Harris.

Rare Captures.—*Debis portlandia.*—I found a locality for this butterfly in a sunny opening in a wood at Lachine, nine miles west of this city.

Erebus odora, Cram.—I received a specimen of this splendid moth, taken in this city in July of this year. It was attracted into a room by light. I believe this is the farthest north that it has been taken. Both these species were kindly determined for me by Mr. Herman Strecker, of Reading, Pa.—Frank B. Caulfield, Montreal, P. Q.

Reduvius raptatorius.—One night at the end of April I caught one of these swift-footed insects, and while holding it between my finger and thumb it managed to insert its proboscis into the latter member and gave me, much to my surprise and disgust, a most savage sting. The pain was very great—much more than that caused by a mosquito, and it continued for about five days, although the thumb did not swell. I put the *R. R.* into a jar of water in which, for a fortnight, I had been keeping a large water-beetle *(Dytiscus)*, feeding it with flies, ectobias and other insects; but this Hemiptera was too much for the poor beetle. It refused to be quietly killed and eaten, but instead, pierced the hard shell which in the morning was floating dead upon the water, while the victor still lived. The mode of the beetles's attacking its prey was very interesting; it would make a sudden dash, seize the quarry with its strong mandibles, then dive down and swim about beneath the surface as if to drown its victim; then after a time it would rise to the top and there quietly crunch up its food,discarding the wings as too dry eating.–R.V.Rogers,Kingston.

Venemous Caterpillars.—Mr. R. Benson, of Madras, India, gives the following account, in a recent number of *Nature*, of pain inflicted by a caterpillar:—"In 1868, when travelling in company with Capt. Street in

the Burmese forests on a botanical trip, and whilst in the act of detatching a specimen plant of *Dendrobium farmerii* from the naked branch of a tree, I felt a severe and painful sting on my thumb. On examination I noticed I had seized hold of a large caterpillar, lodged amongst the roots of this orchid. It was about two inches long, clothed with erect hairs ; its colour was a reddish brown, the lower part of the abdomen being darker, with well-developed legs. My thumb continued painful for three days ; it was considerably swollen, the skin having a drawn glazed appearance. The Burmese told me that this kind of caterpillar was exceedingly venemous, and one fellow was particularly consoling by informing me that unless the pain subsided in three days the sting might prove fatal. I am inclined to think that the caterpillar for self-protection has the power of detaching these hairs ; whether any propelling force is present at the time of detachment it would be difficult to prove. I found steeping my hand in Eau de Cologne gave me the greatest relief."

Mr. Albert Muller communicated the following notes at a meeting of the Ent. Soc. of London, England :—

1. *Arœocerus coffeæ at Basle.*—"On the 29th of September, 1862, while attentively watching the unpacking of some freshly-imported bags of Java coffee, in a warehouse at Basle, a very lively specimen of this beetle came tumbling out of one of the bags. I secured it and kept it alive for some days. In a letter dated the 14th of March, 1873, which I have just received from my lynx-eyed friend Herr H. Knecht, of the same city, he tells me that he can now get this species in any quantity at Basle. It is well known that this species of Anthribidæ feeds in the larval state on raw coffee-berries ; hence its introduction and capture in commercial emporia on the coasts of different continents need cause little surprise ; but the two facts here recorded illustrate once more the indubitable axiom that insects living on merchandise are spread chiefly along the main trade-route, and become acclimatised along their whole course, Basle being one of the chief markets where Central Europe stores and disposes of the purchases derived from Mediterranean and Atlantic ports."

2. *Tribolium ferrugineum in Ground-nuts.*—"In the summer of 1863 a cargo of ground-nuts *(Arachis hypogœa)* arrived in the port of London direct from Sierra Leone. On arrival the usual samples were drawn, when it turned out that the husks were riddled by countless holes, while the

kernels were half eaten up by myriads of larvæ and imagines of Tribolium ferrugineum. So completely had they done their noisome work that in the numerous samples examined scarcely an intact kernel could be found. If a nut was opened the whole interior was often found to be converted into a living conglomerate of larvæ, pupæ and imagines of Tribolium accompanied by the larvæ and perfect insects of a Rhizophagus preying on the former, the whole mass being wrapped up in a layer of cast-skins and excrement. As no purchaser could be found, owing to the deplorable state of the cargo, the work of destruction continued through the months of August, September and October, the owners being unwillingto take a considerably lower price than had been calculated upon. A fresh proof how the marketable value of an article can become reduced through delay and ignorance on the part of its owner."—*The Zoologist.*

The Waxy Exudation of Homoptera.—An exudation, corresponding to that which is characteristic of Aphis Fagi, is common to all the several thousand species of Homopterous insects, and appears more or less, and in various forms, throughout the tribes, from the singing Cicada to the stationary Coccus, and often serves as a defence. In Cicada it is slight and powdery; in some of the tribe, of which the lantern-flies are the most conspicuous representatives, it is excessive, and forms waxy filaments which surpass the body in length. It hardly appears as an emanation from the frog-hoppers; but in the next family, or Psyllidæ, it may be often witnessed in gardens by the multitude of white flecks which proceed from Psylla Buxi on the box-trees, and fall in showers when the branches are shaken. Next come the Aphides, of which the types are distinguished by two pipes, whence the streams of honey flow. The beech Aphis, or A. Fagi, is less typical and less multiplying than many others, and is more sheltered than them from the oviposition of Aphidius by the fleecy or gummy substance which it emits. The American blight, which belongs to this family, is defended by the abundance of its cottony covering. The wax-insect, or Coccus of China, has been mentioned in several books, and a Coccus in Arabia produces a substance which is called manna, and is supposed by some persons to be identical with the manna in the wilderness.—*Francis Walker, in Newman's Entomologist.*

The Colorado Potato Beetle Varying its Food.—A generally received opinion in regard to the Colorado Potato Beetle, *Doryphora 10-lineata* (Say), is that its food is confined to plants of the family Solanaceæ. I have found it this season (June 19, 1872) at Port Austin,

Michigan, sparingly feeding on grass, on which it had also deposited its eggs. Later in the season (July 20), at Fort Gratiot, Michigan, I encountered it in large numbers, in both the larva and perfect states, in the vicinity of potato fields (where it had committed terrible depredations), devouring the younger leaves and flower buds of the common thistle (*Cirsium lanceolatum*, Scop.), which it was rapidly stripping even to its thick stem so that the entire top of the plant hung down, almost severed. In the same neighborhood I also saw it on pigweed (*Amarantus retroflexus* L.), hedge mustard (*Sisymbrium officinale* Scop.), the cultivated oat, smart-weed (*Polygonum hydropiper* L.), and the red currant and tomato of the gardens, as well as the common night-shade (*Solanum nigrum* L.), the last two its more legitimate food. But of the last mentioned plants, with the exception of the night-shade, it ate only the young leaves, and of them very sparingly. The thistle it seemed particularly to relish. Could its attention be diverted from the potato to the Canada thistle it would encounter an object worthy of its prowess ; and the curses which have been heaped upon its striped back would be turned to blessings. But, I fear, little good can be hoped from the capacity, thus evinced, to diversify its food, and so accommodate itself to circumstances. This can only be regarded as another obstacle in the way of its extermination.

Since writing the above I have found the beetle feeding on the maple-leaved goosefoot (*Chenopodium hybridum* L.), lamb's quarters (*C. album* L.), and thoroughwort (*Eupatorium perfoliatum* L.) ; and August 8, 1872, I saw it in the larva and perfect states, voraciously eating the black henbane (*Hyosciamus niger* L.), on which was also to be seen an abundance of the eggs.—Henry Gillman, Detroit, Michigan, September, 1872, *in American Naturalist.*

The Ant-lion.—While in the Indian Ladder Region, Albany Co., N. Y., in August, 1871, I found a large colony of ant-lions. It is situated near the head of the "Ladder Road," at the base of the cliffs and extends for several rods along the path to the "Tory House." The cliffs here hang over the paths, so that it is almost impossible for rain to reach the spot. The soil is composed of disintegrated limestone, extremely fine, but mingled with minute fragments of stone as well as larger pebbles.

In Aug., 1871, the colony numbered rather more than 600 individuals, but on July 6, 1872, there were scarcely half that number. Perhaps at

this last date some were in the chrysalis, as of several specimens thus obtained most of them entered that state in a short time, while those taken in August remained until the following spring.

Food was very scarce in this colony, as it was rare to see more than four or five victims in the lions' dens at one time. On several occasions I noticed a strong and active insect, having ventured over the edge of the pit, run swiftly down and up the other side, leaving the ant-lion wildly snapping its jaws, as the intended victim mounted the steep side of the pitfall.

The ant-lion does not, as far as my observation goes, throw up sand to bring down its prey, but throws it up in every direction in order to keep its jaws free to seize the insect when it reaches the bottom of the den.

In 1871 there was another colony (which I did not visit in 1872) near the "Paint Mine." It consisted of some 300 members. I call it a colony, although, of course, there was no friendly intercourse between the inhabitants of the settlement. On the other hand, in the most crowded portions, the chief employment of the insects was to throw out the dirt which their active neighbors were depositing on their own premises.—E. A. Birge, Williams College, in *American Naturalist.*

Destruction of Dragon-flies by Birds.—Mr. Gould, in a communication to the Entomological Society of London, says, "I believe that the larger dragon-flies are very liable to the attacks of birds, and have no doubt that the hobby and kestrel occasionally feed upon them; with regard to the small blue-bodied species (Agrionidæ) frequenting the sedgy bank of the Thames, I have seen smaller birds, sparrows, etc., capture and eat them before my eyes, after having carefully nipped off the wings, which are not swallowed. This must take place to a considerable extent, as I have observed the tow-path strewn with the rejected wings."—This has been observed by Mr. J. L. Hersey of New Hampshire (see the following note):—Eds.

Bees and King-birds.—For the last ten years I have carefully noted the habits and movements of the king-birds, and have come to the following conclusion, viz.: that they do eat the honey bee, and so does the purple martin; but instead of being destroyed for it, they should be protected and allowed to build their nests near the farm-house, because they drive off the hawks, crows and other plundering birds from the

poultry yard. Warm afternoons in July and August, when the drone bees are out, we have seen the martins come down within ten feet of the hive and snap up the drone bees, thus relieving the workers from the necessity of expelling them from the hive and biting off their wings to prevent them from getting back to the hive. The king-bird also, we find, selects the drone, and will come afternoons and take his position on a stake in front of the hive, and when a drone bee comes along will make a rush for him, come back to the stake, give him a pick or two and swallow him. But says an objector, "What do they subsist on before the drone bees fly out?" This point I settled by shooting one in the month of May, and I found in his crop the wings and legs of May-bugs. By watching their movements, I find the dragon-fly is also a favorite food for them.—J. L. Hersey, *American Bee Journal.*

Agricultural Ants.—Mr. Moggridge has observed at Menton, France, two species of ants (*Aphenogaster*) carrying into their nests, during the winter months, the seeds of certain late fruiting plants. He has traced their burrows to a spherical chamber filled with the seed of a grass which he had seen the ants in the act of transporting. "Outside the channels there was generally a heap of the husks of the various seeds, and sometimes one of those heaps would fill a quart measure. These husks had had their farinaceous contents extracted through a hole in one side. He purposely strewed near the nests large quantities of millet and hemp seeds. After the lapse of a fortnight many of these seeds, previously conveyed into the nests, had been brought out again, they having evidently commenced to germinate, and he then found that the radicle was gnawed off from each seed, so as to prevent further growth, and, this being effected, the seeds were carried back again. The cotyledons of germinated seeds were removed from the nest."—*Trans. Entomological Society of London, 1871.*

ADVERTISEMENTS.

Exchange.—I am desirous to exchange English for Canadian or American Lepidoptera. J. C. Wasserman, Beverly Terrace, Cullercoats, North Shields, England.

Coleoptera for Sale.—A number of Rocky Mountain Coleoptera will soon be for sale in sets by John Akhurst, 19, Prospect Street, Brooklyn, N. Y.

The Canadian Entomologist.

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ON THE GENUS CATOCALA.

BY AUG. R. GROTE., BUFFALO, N. Y.

Catocala Meskei, Grote.

Forewings dentate, pulverulent, of a rather lighter grey than *C. unijuga*. Median lines black, single, not very distinct. A whitish space before the large bisannulate concolorous reniform; sub-reniform likewise whitish, closed, joined to the t. p. line, the latter jagged but without very prominent discal teeth, making a deeper and narrower sinus above vein than in *C. unijuga*. Subterminal upright, dentate, shade (preceding the blackish line) distinct. Terminal line appearing as black lunulated interspaceal marks. Hind wings bright red, somewhat pinkish. The black median band is straight, not regularly curved as in *C. parta*, and straighter than in *C. unijuga*, rather narrow, nowhere greatly excavate, rounding and narrower on the interspace between veins 1 and 2 opposite the excavation of the marginal band, arrested at vein 1, but a few blackish scales mark its continuance towards internal margin. Marginal band narrower than in *C. unijuga*. Ciliæ white, with a few red scales at base, especially at apices. Beneath the median band of the hind wings is narrower than above, with the same peculiarities, constricted at veins 2 and 5, and continued by scattered scales beyond vein 1. Expanse 78 m. m.

Lent me by Mr. O. Meske, after whom I name the species, from near Albany, N. Y., and who writes me that it has been taken in considerable numbers by a collector in that vicinity.

NOTE 1.—Mr. Walker's description of *C. junctura* applies to the secondaries of *C. meskei*, but the color is not "red lead, orange-red towards the base," nor is there any "large elongated apical spot," nor

"red marginal lunules." The fore wings are also very evidently different in tint and color of median spots, while from my recollection of Mr. Walker's type, it was much nearer *C. unijuga* than the present species seems to be.

NOTE 2.—In looking over my paper on this genus, in the Transactions of the American Entomological Society, I find that I have stated in reference to *C. nebulosa*, that "Mr. Edwards compares the secondaries of this species quite wrongly with *C. cerogama*." In reality, Mr. Edwards nowhere directly alludes to *C. cerogama*. I should have written that Mr. Edwards describes the secondaries in such a manner as to lead one to suppose that he intended a species resembling *C. cerogama*, and my idea is correctly expressed in my original description of *C. ponderosa*. I am sorry that in repeating my idea from memory, without referring to former papers, I should have used words not in literal accordance with the facts.

NOTE 3.—The median band of the hind wings in *C. parta* is curved, and occasionally a few dark scales are visible along the cross vein above. Darker specimens of *C. parta*, exhibiting every peculiarity of the species, the apical streak, characters of the hind wings, etc., have occurred about Buffalo with the paler, more usual specimens, and seem to be Mr. Strecker's "nov.? var." *perplexa;* it seems to me that an assumption of bastardy is unnecessary to account for so slight a variation. Mr. Strecker's statement that M. Guenee mistook *C. relicta* for *C. fraxini* must be based on an erroneous comprehension of my quotation of that author. So excellent an Entomologist as M. Guenee could not have made such an error. *Fraxini* was doubtless sent him with an erroneous locality. M. Guenee always shows an appreciation of the slightest differences in separating European and American specimens throughout his great work, and here the difference is excessive. Occasionally we see *Acherontia atropos* incorrectly referred to as occurring in America, nor can in this case any of our Sphingidæ have been mistaken for it. Mr. Strecker criticises the coloring of *subnata;* this plate was published plain and drawn without being intended for coloring; the few copies colored for private distribution are not properly the subject of public criticism. Mr. Strecker's figures, however, *are*, and the coloring of the hind wings of *antinympha*, fig. 7, and *unijuga*, fig. 9, is so bad that I should doubt his determinations were it not that he has taken his information from the collection of the American Entomological Society, which represents my identifications.

NOTE 4.—*Catocala Walshii*, Edwards, is still unknown to me. I believe the types perished in the Chicago fire. It must be nearly allied to *unijuga*. Mr. Edwards' description of the fore wings, "Primaries yellowish brown, clouded between the transverse lines with grey; markings indistinct, but similar to *Unijuga*, Walk; reniform ferruginous, in a pale circlet," is not exhaustive, but it contains nothing contradicting Walker's description of *C. junctura*.

Catocala Arizonæ, Grote.

Size large. Fore wings dentate, rather uniformly dark grayish brown with a glaucous shade over the more grayish median space. Median lines black and rather broad. A whitish shade before the brown-tinged, broadly bisannulate reniform. Sub-reniform rather small, pyriform, whitish brown, connected with the t. p. line, tending to become narrowly open. T. p. line well produced opposite the cell, with two sub-equal rather prominent teeth. A not very deep but broadly marked sub-median sinus. The dark scales tend to connect with the t. a. line along the sub-median interspace. The grey sub-terminal shade, preceding the dentate dark line itself, is not erect, but runs obliquely backward to costa above vein 6. Secondaries pinkish red. Median band rather narrow, not much curved, nearly even, rounding and becoming narrower below vein 2, and terminating at vein 1. Marginal band rather narrow, rather deeply excavate opposite the termination of the median band, and leaving a yellowish apical space tinged with red. Beneath largely pinkish red; the median whitish space on primaries also tinged with red inferiorly. The median band as on upper surface, and seen to terminate a very little before vein 1. Thorax and collar brownish, without perceptible lines. Expanse 80 m. m.

I have received this species from Professor Townend Glover, of the Agricultural Department at Washington. It is labelled "Borders of Arizona and New Mexico.—Dr. Palmer." It is apparently nearest to *C. amatrix*, than which it has more obscurely brown primaries and is perhaps intermediate in character between the group of *C. amatrix* and the Californian red-winged species, represented by *C. californica*.

NOTE.—In my list of the species of *Catocala*, p. 164, 1872, I enumerated 59 species of the genus from our Territory. The total number must be now increased to 63. Of these 11, viz., *Stretchii* Behr., *adultera* Hinze, *irene* Behr., *Walshii* Edwards, *uxor* Guenee, *zoe* Behr.,

nuptialis Walker, *micronympha* Guenee, *connubialis* Guenee, *messalina* Guenee, and Mr. Strecker's *Faustina*, are unknown to me in nature. Already twice the number of species of *Catocala* have been discovered in America than have been described from Europe. The genus does not occur south of Mexico, and has not been discovered in the West India Islands.

NOTES ON AN INTERESTING SPECIMEN OF PAMPHILA ZABULON, Boisd & Lec.

BY H. K. MORRISON, OLD CAMBRIDGE, MASS.

The identity of *Pamphila pocahontas* and *quadaquina* with the typical species *zabulon* has been universally acknowledged, although there exists no more positive proof than the fact that no males of these forms have ever been discovered. I have in my collection an intermediate specimen exhibiting plainly the characters of the original species and of the variety and sub-variety, and apparently a link between them.

The primaries above are like *pocahontas*, except that the spots are a little larger and of a deeper yellow. The secondaries above are exactly the same as in *zabulon*, dark at the base, disk yellow, with a broad black border. Beneath the spots on the primaries are united together, forming a band almost as wide, and of as deep a color as in *zabulon*. Secondaries beneath like *quadaquina*, except that the central light band is hardly as narrow.

As will be seen from the description, the primaries beneath the secondaries above resemble *zabulon*, the primaries above *pocahontas*, and the secondaries beneath *quadaquina*, making the specimen a curious compound of all three.

It is a female, and was taken near Springfield, Mass.

MEETING OF THE AMERICAN ASSOCIATION FOR 1873.

FROM P. R. UHLER, BALTIMORE, MD.

The late meeting of the American Association for the Advancement of Science, held at Portland, Me., was largely attended by the Entomologists of the United States. Thirteen were present, and among them were some of the most eminent in this country. Indeed, Section B. was chiefly officered by Entomologists, Dr. LeConte being Chairman and Mr. Scudder Secretary; while, during the last three days of the session, Rev. Dr. Morris presided over the sub-section Biology, and Mr. Grote acted as Secretary.

On three of the evenings (August 21, 22, 23) the Entomologists held meetings in one of the smaller rooms of the City Hall; Dr. LeConte being chosen to preside, and Mr. Uhler to act as Secretary. As steps had been taken at a previous meeting of the Association to enable the Entomologists to form a sub-section, this subject was reconsidered, but the number of Entomological papers offered being so small, it was not then deemed advisable to go into sub-section.

The following petition was unanimously adopted and signed by all present, to be presented to the American Entomological Society and to the Canadian Entomological Society :—

"We, the undersigned, Entomologists assembled at the 22nd meeting "of the Amer. Assoc. for the Advance. of Science, held at Portland, "hereby respectfully petition the American Entomological Society of "Philadelphia, and the Entomological Society of Canada, to appoint "yearly meetings to be held at the same times and places with the annual "meetings of the American Association. The undersigned are moved to "this memorial from the considerations that such prospective action of "the Societies would ensure the annual assemblage of a large number of "Entomologists resident over a wide extent of territory, and also prac-"tically enlarge the sphere and increase the usefulness of these "Societies."

The following resolution in reference to the above was also recommended by the Standing Committee of the American Association, and adopted:—

"Resolved, That the American Association for the Advancement of "Science hereby endorses the accompanying memorial, and invites the "Entomological Societies to call yearly meetings of their members, in "accordance with the request therein contained."

Mr. Riley, from the Committee appointed a year ago on Nomenclature, requested that in view of the absence of some of its members, the Committee be dismissed. On motion a new Committee was appointed, consisting of Messrs. Edwards, Scudder, Riley, Bethune, and LeConte, to report at the next annual meeting of the American Association, a code of rules, to be discussed and adopted at said meeting, regarding a uniform nomenclature for the guidance of American Entomologists.

Several Entomological papers were read before Section B. of the American Association; one being by Mr. Grote, entitled "Remarks on the Origin of Insects, and on the Antennal Characters in the Butterflies and Moths;" another by Dr. J. L. LeConte, "Hints for the Promotion of Economic Entomology in the United States;" a third by P. R. Uhler "On a Remarkable Group of Wasps' Nests Found in a Hollow Stump in Maryland;" a fourth by Cyrus Thomas, "On the Identity of the Locust of the Prophet Joel with the *Oedipoda migratoria* of Europe," and a fifth by W. L. Coffinberry, "On Spiders."

The meeting was a very pleasant one to the Entomologists, and enabled them not only to freely exchange opinions respecting subjects of wide spread interest, but also to get a glance at the interesting Fauna of the regions which they visited.

THE LAW OF PRIORITY IN NOMENCLATURE.

BY H. K. MORRISON, OLD CAMBRIDGE, MASS.

In a recent article in the ENTOMOLOGIST it is proposed to obviate the confusion in which our nomenclature is involved, by accepting the names most generally in use and allowing the law of priority (if it does not make too much trouble!) to determine all questions which may hereafter come up; ignoring entirely the claims of older authors and of writers holding different opinions from the proposers of the scheme. This

proposal, notwithstanding its arbitrary and unscientific character, and its injustice to other Entomologists, would perhaps be accepted by those who have more regard for present convenience than for the establishment of a solid foundation for Entomological Science. Unfortunately, however, the proposition, although at first view practicable, leaves the matter exactly where it stood before.

Where is the authority that will be accepted by everyone when that authority is governed, not by those fixed laws which should determine questions of scientific nomenclature, but by individual opinion, the convenience of some particular class, or of the present generation of students? Surely Mr. Mead does not intend, as would be inferred from his article in the June number of the ENTOMOLOGIST, that we should accept the most recent names, or those which, having been published in this country or by some well-known author, are more familiar to or more generally in use among American naturalists.

There are a few species, which from the excellence of their original description and plates, or from their recent publication, have no synonymy; these are the only species which can be properly considered as accepted *by all* (if we reject priority.)

All that the friends of priority ask is that it should be allowed to decide between names already *in use*. Allowing that the term "in use" should be applied in science to any name attached to a recognizable description, published in a work which is or has been on sale; names which are advanced in pamphlets printed for the private use of the author, and only distributed among his friends; and in state agricultural reports not for sale (except at second hand) can not be considered as published at all.

To determine whether a description is recognizable or not is a matter of much more difficulty, for here the judgment of individual students would be likely to differ very much. We do not believe that every name advanced by the older authors, often with but a line or two of loose description, or a plate giving only a general idea of form and color, should be retained. We do think, however, that whenever there exists a valid description, the law of priority should take its course. In some cases in which the description is not definite enough to determine the species, but there exist authenticated types; and in those cases in which the species is

not fully described by the author, but is afterward limited and restricted by other writers previous to the publication of synonyms, we think the law of priority should apply.

The supporters of the law of priority do not so much insist upon its application in those few cases in which opinion as to the validity of the description is denied, as upon its being taken as the acknowledged guide in the great majority of cases in which recognizable descriptions are attached to both names.

The difference between the catalogue of Mr. Kirby and that of Dr. Staudinger is easily explained.

Dr. Staudinger may have adopted priority in some cases, but he certainly has not in all. For instance, he has not in several cases recognized the names of Fourcroy, Scopoli, Bergstrasser and others. The differing degree of strictness with which the law was carried out, is sufficient to explain the discrepancy in the catalogues.

To be effective, priority must be rigidly enforced. The advantages to be gained by the universal adoption of this law are so great to us, and more especially to the future Entomologist, that the drawbacks, formidable at first, but steadily decreasing with time, can, it seems to us, offer but slight resistance to its entire acceptation.

LIST OF COLEOPTERA OF ST. LOUIS COUNTY, MISSOURI.

BY S. V. SUMMERS, M. D., NEW ORLEANS, LA.

(Continued from Page 147.)

DYTISCIDÆ.

CNEMIDOTUS, *Illig.*
12-punctatus, *Aube.*
HYDROPORUS, *Clairv.*
hybridus, *Lec.*
imbelus, *Lec.*
HYDROPORUS, *Clairv. (continued.)*
pratruelis, *Lec.*
moestus, *Aube.*
lacustris, *Say.*
notus, *Lec.*

HYDROPORUS, *Clairv. (continued.)*
undulatus, *Say.*
sericeus, *Lec.*
lineolatus, *Lec.*
dispar, *Lec.*
impressus, *Lec.*
nubilus, *Lec.*
HYDROCANTHUS, *Say.*
atripennis, *Say.*
LACCOPHILUS, *Leach.*
maculosus, *Say.*
fasciatus, *Aube.*
COPTOTOMUS, *Aube.*
interrogatus, *Fabr.*
MATUS, *Aube.*
bicarinatus, *Say.*
COLYMBETIS, *Clairv.*
biguttulus, *Germ.*
COLYMBETIS, *Clairv. (continued.)*
binotatus, *Harr.*
AGABUS, *Leach.*
punctatus, *Aube.*
taeniolatus, *Lec.*
semivittatus, *Lec.*
ambiguus, *Lec.*
HYDATICUS, *Leach.*
basillaris, *Lec.*
ornaticollis, *Lec.*
fascicollis, *Harr.*
ACILIUS, *Leach.*
fraternus, *Lec.*
DYTISCUS, *Linn.*
fasciventris, *Say.*
CYBISTER, *Linn.*
fimbriolatus, *Mels.*

GYRINIDÆ.

GYRINUS, *Linn.*
affinis, *Aube.*
analis, *Say.*
pernitidus, *Lec.*
DINEUTUS, *McLeay.*
americanus, *Say.*
discolor, *Aube.*

HYDROPHILIDÆ.

HELOPHORUS, *Fabr.*
lineatus, *Say.*
scaber, *Lec.*
HYDROCHUS, *Germ.*
scabratus, *Muls.*
simplex, *Lec.*
impressus, *Zimm.*
HYDROPHILUS, *Geoffr.*
ovalis, *Ziegl.*
triangularis, *Say.*
nimbatus, *Say.*
striolatus, *Lec.*
sublaevis, *Lec.*
HYDROPHILUS, *Geoffr. (continued.)*
glaber, *Hbst.*
HYDROCHARIS, *Latr.*
obtusatus, *Lec.*
BEROSUS, *Leach.*
miles, *Lec.*
pantherinus, *Lec.*
infuscatus, *Lec.*
exiguus, *Lec.*
bimaculatus, *Lec.*
penguia, *Lec.*
tomentarius, *Lec.*

PHILHYDRUS, *Sol.*
cinctus, *Lec.*
perplexus, *Lec.*
maculicollis, *Muls.*
ochraceus, *Mels.*
pygmæus, *Fab.*
HYDROBIUS, *Leach.*
regularis, *Lec.*
CYCLONOTUM, *Er.*
estriatum, *Er.*
CERCYON, *Leach.*
flavipes, *Er.*
limbatum, *Mann.*
centrimaculatum (var.) *Er.*

SILPHIDÆ.

NECROPHORUS, *Fab.*
marginatus, *Fab.*
americanus, *Oliv.*
pustulatus, *Hersch.*
velutinus, *Fab.*
SILPHA, *Linn.*
surinamensis, *Fab.*
marginalis, *Fab.*
inæqualis, *Fab.*
SILPHA, *Linn. (continued.)*
peltata, *Lec.*
var. terminatum, *Kirby.*
var. affine, *Kirby.*
CATOPS, *Fab.*
opacus, *Say.*
SERICODERUS.
flavidus.

SCYDMÆNIDÆ.

MICROSTEMMA, *Motsch.*
lecontei, *Motsch.*
SCYDMÆNUS.
capillosulus, *Lec.*

PSELAPHIDÆ.

CEOPHYLLUS, *Lec.*
monilis, *Lec.*
CTENISTES, *Reiche.*
piceus, *Lec.*
zimmermanii, *Lec.*
TYCHUS, *Leach.*
longipalpus, *Lec.*
BRYAXIS, *Leach.*
conjuncta, *Lec.*
dentata, *Say.*
abdominalis, *Aube.*
BRYAXIS, *Leach. (continued.)*
puncticollis, *Lec.*
rubicunda, *Aube.*
DECARTHRON, *Brend.*
formiceti, *Lec.*
BATRISUS, *Aube.*
globosus, *Lec.*
nigricans, *Lec.*
RHEXIUS, *Lec.*
insculptus, *Lec.*

(To be Continued.)

ON SOME OF OUR COMMON INSECTS.

8. *THE BACON BEETLE—Dermestes lardarius, Linn.*

BY W. SAUNDERS, LONDON, ONTARIO.

This interesting little beetle, of which we give an enlarged drawing, as well as a representation of its larva, in fig. 18, is a very destructive creature, dreaded by every Entomologist who has had any experience of its ravages. Its larva is very destructive also in some carelessly kept provision and household stores, affecting hams, bacon, old cheese and other substances. It is a European insect, which has long been naturalized in this country, where it seems to be quite as much at home as in its native land. If this beetle can find its way into the drawers or boxes where the Entomologist has his specimens stored, it deposits its eggs on the bodies of the dried insects, where, as soon as the young larvæ are hatched, they begin at once to work their way towards the interior, and here they live and gradually fatten on the dried up viscera of the dead moth or butterfly, skilfully hiding themselves within the body they are consuming, and leaving, when their work is completed, only the bare shell which frequently falls to pieces when disturbed. Where the beetle cannot get at the bodies of the insects to deposit its eggs upon, it will often lay them by the side of small openings or crevices in such boxes, through which the young larvæ enter and at once begin their work of destruction. Besides the substances already mentioned, these larvæ feed on feathers, skins, cat-gut, hair and have even been reared on bees-wax, so that their appetite is by no means a dainty one, and their digestive powers may be considered good.

Fig. 18.

The larva is an ugly, brown, hairy creature, its body tapering from head to tail, and furnished with a pair of short, curved, horny spines on the top of the last joint; it is quite active in its movements, crawling about with a wriggling motion. The beetle is about three-tenths of an

inch long, of an oblong oval form, black, with a wide band across the wings at their base, of a dull, pale buff colour, dotted with black. Its legs are short, and it is rather timid and slow in its movements, feigning death for a time when disturbed.

Collections of insects and birds need to have a constant watch kept on them to keep out these intruders. Camphor, which seems to be offensive to these beetles, is frequently used to deter them from entering; but where they have entered and begun their devastating work, they cannot be dispossessed by such mild measures; in such instances purified benzine applied freely to the saturation of the bodies of the insects occupied will destroy the *dermestes* larvæ without injuring the collector's specimens.

NOTES ON APHIDES.

BY FRANCIS WALKER, LONDON, ENGLAND.

The following notes were suggested by "Observations," &c., on Aphides in THE CANADIAN ENTOMOLOGIST for July, 1873. The species noticed on *Rumex crispus* seems to have very much resemblance to *A. rumicis* in Europe; some other species of N. America do not differ from those of Europe, but have been probably introduced by means of shipping. With regard to European Aphides it is well known that the winged female of many species appears in the spring, that the wingless female is more fertile than the winged one, that the winged state is, partly at least, by means of the diminution of quantity or alteration of quality in the food, and that the winged state enables the species to have a change of habitation and thus to continue its race till the autumn. It is also well known that the male and the oviparous female do not appear till the autumn, and W. Curtis in the last century remarked that this appearance was owing to the change in the atmosphere and to the consequent difference in the food. The male is, in a few instances, wingless, but is very generally winged, and the oviparous female wingless, but in some few species the oviparous female is always winged.

From the great resemblance between N. European and N. American insects, especially in the more northern parts of each continent, it seems likely that the difference of the manner of life which is suggested by the "Observations" does not really occur. However, there would be much interest in the comparison between European and N. American Aphides, and in observing how far they are mutually counterparts, and in the investigation of N. American species from Canada southward, and in discovering the gradual change in their number and habits.

In Europe there is yet much to learn in their range between Lapland and S. Italy, the latter being the southern limit of the region in which they are known. The history of Aphides in Africa, Asia and Australia is yet almost unknown, though one species has been noticed in Madagascar, another in Hindostan, a third in China, one or two in the Eastern Isles and one in Australia. The parasitic Aphidii have been stated to be plentiful in N. America like as they are in Europe, and thus they afford a subject of enquiry as to the mutual resemblance in the species of the two continents, and the same may be said of the other parasites of the Aphides and those of the Aphidii.

MICRO-LEPIDOPTERA.

BY V. T. CHAMBERS, COVINGTON, KENTUCKY.

Continued from Page 152.

ERRATA.

Ante p. 44, line 2nd from the bottom, for 'nipped' read *ripped.*

" 46, for '*amogattella*' read *auroguttella.*

" 47, for '*juglandisnigracella*' read *juglandisnigraeella.*

" 48, and wherever else the name occurs in these papers, for '*L. tritenoeanella*' and other misprints of the same name, read *L. tritaeniaella.*

XYLESTHIA.

X. Clemensella. N. sp.

Head and palpi snow white or hoary, the outer and under surfaces of the palpi yellowish dusted freely with fuscous; antennae yellowish. Primaries yellowish, reddish yellow and stramineous, with some white scales, and densely dusted with dark brown and bluish black scales, the dusting being much more dense in the middle and costal portions of the wing than in the dorsal and apical portions. There is a white costal streak just before the cilia and another very faintly indicated before the middle: dorsal cilae whitish at their beginning; ciliae brown. Thorax white dusted with dark brown; abdomen dark brown; legs and under surface whitish, rather densely dusted with brown, the legs with white annulations, and the anterior tarsi darker than the others.

There is a tuft of raised scales on the fold at the base of the primaries and three other large ones between the fold and the dorsal margin, two small ones about the end of the cell, three or four small ones on the disc and three or four others in the apical part of the wing.

As this species approaches *X. pruniramiella* Clem., the only other described species of the genus, I have hesitated to describe it as a distinct species, but it differs so decidedly from Dr. Clemens' description of *pruniramiella* that I conclude it must be a distinct species.

ARGIOPE.

A. dorsimaculella. Ante p. 13.

This species, for which I erected this genus, belongs to the *Glyphip terygidæ* near *Glyphipteryx*, and may be found to belong to *Acrolepia* Curt.

ADRASTEIA.

A. quercifoliella. Ante p. 72, and v. 4, p. 206.

The identity of this species with *Psoricoptera gibbosella* St., suggested at p. 72 *ante*, was based upon Mr. Riley's identification of the two, and upon a bad translation of a generic diagnosis from the German. Since the remarks at p. 72 were written, I have seen Mr. Stainton's generic and specific diagnosis in *Ins. Brit., v. 3* (to which I had no access until this summer), and find that the most distinctive character there given and

figured is the tuft of scales on the inner surface of the terminal joint of the labial palpi—a character which I have never found in any of the species which I have placed in *Adrasteia*. I am therefore not satisfied that the two genera are exact equivalents.

GELECHIA.

G. scutellariaecella. N. sp.

This species approaches closely those which I have placed in *Adrasteia*. There is a distinct divided bunch on the second joint of the palpi, but it is smaller than in the species which I have placed in that genus, and there are no tufts of raised scales. It differs from the true *Gelechia* in having the last joint of the palpi but little more than half as long as the second joint, and the antennae but little more than half as long as the wings.

Blackish brown, tinged with blue, dusted with pale or bluish white, with an indistinct whitish costal streak before the cilia, and an opposite dorsal one. The white dusting of the primaries is more dense and more hoary towards the apex of the primaries. Inner surface of the palpi yellowish. *Al. ex.* ⅜ inch. Posterior tibiæ clothed with a tuft of long hairs.

This is a very plain and inconspicuous insect, principally remarkable for the habits of the larva. It is white, with green contents, and head pale straw color, and mines the leaves of the "Scullcap" (*Scutellaria lateriflora*). It constructs a case or tube of silk lined externally with its frass. The tube is nearly flat, but curved, one side being convex and the other concave, and it is wider at one end than at the other and attached by its narrower end to the under surface of the leaves, and from it the larva passes into the leaf to feed, retiring into the case when alarmed and to pupate. It constructs but one case, and I think the attachment of that one to the leaf is permanent, and that the larva makes but the one mine.

I have never found it except in a single locality—near the village of Verona, in Boone County, Kentucky. There it is very abundant in September and October.

G. solaniiella.

G. similiella, v. 4, p. 193.

Similiella is a bad name for anything, and as I have discovered the larva of this species, I change the name accordingly.

The larva is at first whitish, but before maturity becomes deep greenish blue. It mines the under surface of the thorny leaves of *Solanum Carolinense*, eating the parenchyma entirely out of the mined portion, which looks like a dead, dry blotch, and the leaf usually curls over the mine. The larva constructs a sort of tube in the mine by sewing the upper and lower cuticle together, and it usually resides in this tube. In confinement it leaves the mine to pupate in a cocoon on the ground, and most probably does so in a state of nature.

G.? unistrigella. N. sp.

White. Primaries very sparsely dusted with pale fuscous in the apical portion; a fuscous spot about the middle of the costa, with two other small ones between it and the dorsal margin; a fuscous streak begins at the base of the costal margin and extends along that margin for a short distance, passing thence obliquely backwards across the wing, but not quite reaching the dorsal margin. Antennae pale fuscous, with narrow white annulations; palpi white, suffused with fuscous on the outer surface of the second joint, and with a fuscous ring near the base of the third joint. *Al. ex.* ½ inch. Kentucky.

Wings in repose almost horizontal, as in *Depressaria? (Gelechia) cercerisella*, which it also resembles in the palpi, which in both are those of *Gelechia.*

CORRESPONDENCE.

DEAR SIR,—

I have to thank you for your remarks on Mr. Andrews' note, printed on page 135. They render any reply of mine to Mr. Andrews almost entirely unnecessary. I have merely to add to your statements that I was entirely ignorant that the specimens of Heman's *marginalis* belonged to Mr. Andrews, nor knew that Mr. Andrews was at all concerned in the

matter till I read the note in the CANADIAN ENTOMOLOGIST. I received from Mr. Strecker his material belonging to Heman's *Hæmorrhagia* and *Alypia* for determination, and all the indication on the specimens of Heman's *marginalis* was the number 3, which referred to the locality "Michegan" in Mr. Strecker's letter to me accompanying the specimens.

AUG. R. GROTE.

September 11th, 1873.

DEAR SIR,—

I scarcely think that I intended my letter (in reference to Mr. Grote) to be published. However, as it has afforded you an opportunity to apply the lash where it was deserved (albeit it was somewhat over my shoulders) I do not regret its publication. In justice, however, to myself, I must request you now to give a place to this my response.

You totally misconceived the object of my complaint if you imagined that I sought "*sympathy*." The wrong was impertinent, but not cruel. Personally, I could have passed over Mr. Grote's conduct without shedding a tear. But this gentleman has made himself, so far as Entomology is concerned, public property, and when a man in such a position perpetrates a wrong which, if repeated, may lead to injurious consequences, I think it the duty of any one cognizant of that wrong to expose it.

You seem to justify Mr. Grote, who, however, as my letter showed, was not required to make any of the investigations you allude to.

Here is a parallel case: *A* is a "money expert," knows good money from bad. B has a doubtful five dollar bill which he sends to *A* for his opinion as to its genuineness. *A* looks, determines that it is good, and puts it in his pocket! After a while B writes for the opinion, and, of course, for the bill. The answer comes this time, thus: "Oh, yes, your bill is good; so good indeed, that, imitating the great Ben Butler with his salary-grab, 'I have bought butcher's meat with it!'"

Now, you say that *A* is right; and, worse still, that you have no sympathy with B. Serves him right, I suppose.

W. V. ANDREWS, New York.

DEAR SIR,— September 18th, 1873.

It is my duty to say a word to your readers in reference to my accusations against Mr. Grote, and which appeared in your last issue.

Those accusations have occasioned a good deal of feeling betwixt Messrs. Grote and Strecker, if one may judge from the correspondence which has since passed between them, and which, by the courtesy of the respective gentlemen, I have been permitted to see.

Without betraying any confidence, I may say that the whole thing is resolved into a question of veracity as betwixt those two gentlemen, and I must say that while I feel confident that neither party would state a falsehood, there certainly is a great imperfection of memory somewhere—where, I, of course, cannot decide.

The statements made in my note, already referred to, were almost literally as told me by Mr. Strecker. Mr. Grote denies that he received any limiting instructions from Strecker. So the matter stands.

Let the thing drop altogether. It is not of sufficient importance to waste another sheet of paper about it. My object was not, Sir, as you imagined, to enlist a childish sympathy in my favor, it was meant to check a practice of which I had heard a good deal, and which, if continued, could not fail to exert an injurious influence on Entomological Science in America.

W. V. ANDREWS.

MR. STRECKER'S CORRECTIONS.

DEAR SIR,—

Mr. Strecker, of Reading, Penn., has been in correspondence with Mr. H. B. Moschler, who has written some very valuable articles on the Lepidopterous Fauna of Labrador, in the *Wiener Entomologische Monatschrift*, and whose description of *Gelechia labradorensis* I have translated in these pages. Mr. Strecker corrects the name *speciosissima* Mosch. to *speciosa* Mosch., in the citation of a species of *Arctia* in Mr. Robinson's and my List (1868).

This is right, and I committed an error in transcribing the name, and one that escaped me on the proofs, but was detected about fifteen minutes after the printed copies were in my hands. Mr. Strecker next, on

information from Mr. Moschler, unites *A. quenselii* Geyer and *A. gelida* Moschler, cited separate in our "List." This correction, coming from the author of the synonym, is doubtless of value, but we have no responsibility in the matter nor did we "fall into any error." If Mr. Strecker will refer to the two names in the List, he will find them followed by a dash (—), and from our preface he may gather the information that this dash indicates that we do not know the species and are not to be held accountable for their value. Next, Mr. Strecker (undoubtedly on the strength of Mr. Moschler's letters) says we fell into the same error with regard to *Arctia parthenos* Harris, and *Arctia borealis* Moschler. Mr. Strecker should have read my statement that the two were probably identical, published in the Proc. Ent. Soc. Phila., pp. 74 and 537 (1864). The species were, however, described as distinct by Professor Packard and the names are kept separate on this authority in the List; *borealis* being followed by a dash, since we do not know it as distinct from *parthenos*. At the time of describing *borealis*, Mr. Moschler did not know that Harris had described an allied species, nor in describing *speciosa*, that Kirby had described *virgunecula*, since he does not allude to them; but perhaps, after all, the species described by Moschler from Labrador, may be distinct; at least it is yet an open question whether they are so or not. Where is *our* "error," then, with respect to these species of *Arctia?*

With only partial quotation of our remarks, Mr. Strecker unites our *luteola* from Quebec with *cordigera* from Lapland. We had only *mystilli* in nature for comparison, and judged of *cordigera* by description when we described *luteola*. That we judged the American to be a near ally of the European species is evident from our remark that it "*appears* to represent the European *cordigera* in our fauna." Now, that Mr. Strecker has received from Europe specimens of *cordigera* and compared them with *luteola*, and finds no difference, it becomes probable that they are the same species. This information is very interesting in a distributional point of view.

To conclude this notice I will draw attention to Mr. Strecker's repeated remarks that "great confusion exists with regard to the species of *Catocala*." These are not true of the most prominent collections of that genus. There is but little uncertainty about our species, and that with regard to the limits of a very few of them. I have determined during the last ten years nearly all material in this genus, sent to me from Canada, to Georgia, and all of Mr. Strecker's determinations have

come at first or second hand from me. The very poor descriptions in the Lepid. Het. have not as yet improved our knowledge of our species, except to the extent of giving us three very doubtful forms as new, the best of which *(C. obscura)* I thought might be Guenee's indicated var. of *insolabilis*, and so informed Mr. Strecker, who sent me a specimen for examination, accompanied by an epistolary threat that if I did not give him the name of it within a certain time, he would "describe it as new."

A. R. GROTE, Buffalo, N. Y.

MISCELLANEOUS.

AN AQUATIC BOMBYCID MOTH.—Mr. Bar, of Cayenne, has forwarded to the Entomological Society of France, descriptions and specimens of the various stages of an interesting Bombycid. The larva lives under stones in streams and rises to the surface for transformation. The cocoons are found in clusters floating on the water. Aquatic caterpillars have hitherto been known only in the lower families of Lepidoptera.—*American Naturalist.*

MODE OF EGG-LAYING OF AGRION.—Mr. G. W. Dunn writes us that while collecting at Santa Cruz, California, he observed a species of Agrion (as we find the insect to be) "flying about the water united, male and female. The female would light on a spear of grass growing in the water; the male would then let go, and the female go down the grass twelve or fifteen inches under water and deposit her eggs."—*American Naturalist.*

ADVERTISEMENTS.

EXCHANGE.—I am desirous to exchange English for Canadian or American Lepidoptera. J. C. WASSERMAN, Beverly Terrace, Cullercoats, North Shields, England.

COLEOPTERA FOR SALE.—A number of Rocky Mountain Coleoptera will soon be for sale in sets by JOHN AKHURST, 19, Prospect Street, Brooklyn, N. Y.

The Canadian Entomologist.

VOL. V. LONDON, ONT., OCTOBER, 1873. No. 10

EDITORIAL.

Our readers will observe, from the alteration in our title-page, that a change has been made in the occupant of the Editorial chair of this publication. At the annual general meeting of the Society, held at London on the 25th ult., the Rev. C. J. S. Bethune tendered his resignation of the office of General Editor, and Mr. Wm. Saunders was unanimously elected to take his place. This change of personality will make no difference in the character and management of this journal, except in the direction of improvement in material and greater regularity in issue. For some time past Mr. Bethune has desired to vacate the position of Editor—not from any diminution in interest in the publication, or from any cooling in zeal and attachment to the cause of Entomology—but solely because his position as Head Master of Trinity College School, entails upon him so much labour and engrosses so much of his time, that he cannot satisfactorily perform the duties that properly devolve upon the Editor of the CANADIAN ENTOMOLOGIST. Since the removal of the head quarters of the Society to London, the labour attending upon the issue of this publication has gradually fallen more and more upon Mr. Saunders, though largely shared in by Mr. Reed, the late energetic Secretary-Treasurer of the Society.

The retiring Editor—who will continue to aid in the maintenance of the journal, as far as his time will permit—begs to offer his most cordial thanks to all those kind friends who have rendered him so much assistance in the past, and to request that the same hearty support and co-operation may be afforded to his friend and successor.

ANNUAL ADDRESS

OF THE PRESIDENT OF THE ENTOMOLOGICAL SOCIETY OF ONTARIO, 1873.

To the Members of the Entomological Society of Ontario :

GENTLEMEN,—Ten years have now gone by since a few of us met at the house of Professor Croft, in Toronto, and organized this Society. We commenced with less than five and twenty members, and now our Secretary informs us that we have over three hundred names upon our roll. A twelve-fold increase in a decade of years is certainly an evidence of progress upon which we may well congratulate ourselves, and which ought assuredly to stimulate all our members to use their utmost exertions for the maintenance and improvement of the Society. Those of us who from year to year have been entrusted by you with positions of office and duty in the Society, cannot but feel that it is for the best interests of our institution that more of its members should be led to take an active part in its work, and thus secure more efficiency in all our departments, and more certainty of a permanent developement of all our operations. Hitherto the work has fallen upon a few of us, and we have endeavoured to perform it as efficiently and heartily as we can ; but we find that year after year our own professional and other duties make increased demands upon our time and attention, so that with all the desire in the world to devote ourselves to our favourite branch of Natural Science and the operations of the Entomological Society, we are unable to do so to the same extent as in earlier years. On this account—not from any diminution of zeal and interest on our own part—we are most anxious that more of you should take your share in the work and aid us in maintaining unimpaired the good reputation that the Society has already achieved. Each one, we are sure, can do something, and the united efforts of us all must assuredly be productive of satisfactory and permanent results.

Our sister Society—the Fruit Growers' Association of Ontario—we rejoice to see is rapidly growing in public appreciation and favour ; its members' list of over 3000 names, its well-attended meetings in various parts of the country, its judicious distributions of fruit for experimental

purposes, and the vigour and zeal of its executive, are all matters upon which we may well congratulate its President, Directors and Members. That it may go on and prosper, and extend its work throughout our land, till every resident of the Dominion enjoys the fruit of his own vine and his own fruit-tree, is our most hearty aspiration.

During the past year but little has occurred in an Entomological point of view that calls for especial notice on this occasion. A year ago I ventured to call your attention to the subject of Specific and Generic Nomenclature, which has been so unpleasantly exciting the minds of Entomologists both here and almost everywhere else. My remarks, I was gratified to find, elicited a good deal of discussion in the pages of the CANADIAN ENTOMOLOGIST, and brought forth a very able paper upon the subject from the pen of Mr. W, H. Edwards, of West Virginia. The question, however, has by no means yet been set at rest and will no doubt continue to exercise us all for some time to come. At the Dubuque Meeting of the American Association for the Advancement of Science, a sub-section of Entomology was formed, and a committee of its adherents specially appointed to consider and report upon a series of rules upon nomenclature. Unhappily—owing to various circumstances—no report was drawn up, though, I must in justice state, that my friend Mr. C. V. Riley, of St. Louis, took a great deal of pains to elicit the views of the members and to draw up some conclusions from them. Last month, at the Portland meeting of the Association—which, to my very great disappointment, unavoidable engagements prevented me from attending—a new committee was appointed to re-consider the subject, and we trust that some definite rules will have been decided upon by its members before the meeting of next year at Hartford, Conn.

You will all, I have no doubt, be gratified to learn that, upon the suggestion of the sub-section of Entomology, the American Association unanimously passed a resolution inviting our Entomological Society of Ontario, as well as the American Entomological Society, to hold a general meeting of our members at Hartford next year during their annual session. I trust that this invitation will be cordially accepted and that a large number of us may there meet our American friends and enlarge and strengthen those cordial feelings of scientific brotherhood which have so long pleasantly existed between us. I may add, as a notable token of the estimation in which our branch of science is now held, that the Association will meet next year under the presidency of our ablest American Entomologist—Dr. J. L. Leconte, of Philadelphia.

You have already heard from our Secretary-Treasurer's Report the satisfactory condition of our finances and other business matters; I need not therefore trespass further upon your patience and attention. Heartily thanking you, gentlemen, for your kindness towards myself and my colleagues during our term of office, and for the honour which you have conferred upon me by calling me to preside over you,

I have the honour to remain, with best wishes for the advancement and prosperity of the Society,

Your humble and obedient servant,

CHARLES J. S. BETHUNE,

President Entomological Society of Ontario.

Trinity College School, Port Hope, Sept., 1873.

ON THE IDENTITY OF GRAPTA DRYAS WITH COMMA.

BY W. H. EDWARDS, COALBURGH, W. VA.

On the 30th of July Mr. T. L. Mead, at Coalburgh, took two females of *Grapta Dryas* and tied them in a muslin bag to a branch of Hop-vine. The result was a large number of eggs, laid on the leaves and in the bag. On the 5th the eggs were all hatched. The larvæ we carried through safely, and on the 21st the first ones began to change to chrysalids. In course of the next three days all were changed, upwards of sixty. Towards maturity some of the larvæ were white, as represented in the plate of *Dryas*, in the "Butterflies of North America." The others were black, like the larvæ represented in plate of *Comma* in the same volume. On the 30th the imagines began to appear, and nearly all are true *Comma;* but six are *Dryas*, two ♂ and four ♀. The relation of the two forms to each other is therefore similar to that of the two forms of *Interrogationis*. The name of the species should be *G. comma*, Harris, and the one form the type figured in my plate as *comma*, should be called *comma var. Harisii*, and the other *comma var. dryas*, the two being equal varieties of one species and not one a variety of the other.

MICRO-LEPIDOPTERA.

BY V. T. CHAMBERS, COVINGTON, KENTUCKY.

Continued from Page 176.

EVIPPE, *gen. nov.*

Primaries—The costa attains the margin before the middle: the subcostal, which is faint towards the base, sends a branch to the margin from before the middle, two others near the end of the cell, another beyond the cell and becomes furcate before the tip, one of the branches going to each margin. Cell closed by a very short oblique discal vein without branches. The median sends two branches to the margin before the end of the cell, and becomes furcate behind it. Submedian furcate at base, Wing lanceolate, with moderately long ciliae.

Secondaries—Narrower than primaries, short, tip produced and margin deeply incised beneath it; costal margin slightly excised from before the middle to the tip. Costal rather short, attaining the margin at the excision. Subcostal simple, rather faint towards the base, attaining the margin just before the tip. Cell unclosed. No discal nervure, but an independent branch which arises near the median and going to the hind margin. Median three branched, the first arising near its middle (and rather minute) from the second. Submedian and internal short and indistinct.

Head smooth with appressed scales. Tongue moderately long, scaled at the base. Maxillary palpi microscopic. Labial palpi overreaching the vertex, second and third joints of about equal length, the second being slightly thickened with scales beneath. Antennæ simple, about half as long as the wings.

In repose the antennae are carried upon the wings, which are deflexed, the head is applied to the surface, and the posterior end of the abdomen and wings are elevated. It runs very rapidly, and is easily disturbed. The structure, especially that of the antennae and wings, allies it to *Trypanisma* Clem., but there is something in its appearance which reminds one of a

Gracillaria, and the pattern and shades of coloration approach those of *G. salicifoliella*. It is, however, nearer to *Agnippe, ante v. 4, p. 194*, than to *Trypanisma*. The neuration of *Agnippe* is incorrectly given at *v. 4, p. 194*. That of the primaries is identical with that of this species, except that it lacks the first subcostal branch of this species ; and that of the secondaries is identical with this species. I do not feel certain that I am right in separating them generically. *Gelechia ? difficilisella, ante v. 4, p. 192*, belongs to the same group, near to if not in *Trypanisma*.

E. prunifoliella. N. sp.

Labial palpi silvery white, except the base, which is dusky, and the tip, which is dark gray brown. Head silvery white. Antennae dark grayish brown. Thorax dark grayish brown on each side above the wings with a broad median longitudinal white streak from the base to the apex and continued thence along the posterior margin of the primaries to the cilia. Primaries (except the posterior margin as just stated) dark grayish brown, the line between the two colors scalloped, or rather the white portion sends two or three teeth or processes into the brownish part, one of which is just before the ciliae and is opposite to a costal white streak ; dorsal ciliae dusky silvery dusted with dark brown. Secondaries pale yellowish fuscous.

When the insect is in repose it appears to be dark gray brown, with a wide white streak from the mouth over the head, thorax and wings to the dorsal ciliae. *Al. ex.* 3/8 inch. Kentucky.

I do not know whether the larva is at any time a miner or not. It feeds upon the leaves of the Red Wild Plum *(Prunus Americana)*, where I have found it in September feeding under the tip of the leaf turned downwards. The larva is pale green, immaculate. I have frequently found on the under side of the same leaves a tentiform mine which I suspected to be that of *Lithocolletis crataegella* Clem., but I have never succeeded in rearing the insect from it, and *possibly* it may be made by this species in its younger stages.

EIDOTHOA, *gen. nov.*

The insect upon which I found this genus resembles *Evippe prunifoliella* so closely that I have hesitated much as to the propriety of separating them generically. The differences most marked are in the

neuration. The discal cell of the primaries is wider in this species and the discal vein is of course longer, and the median, instead of being three branched with the third branch furcate behind the cell, divides into three approximate simple branches about the end of the cell. In *Evippe* the median vein of the hind wings is three branched, in this species it is two branched.

The antennae in this species are also a little longer than in *E. pruni-foliella.*

In other respects it does not seem necessary to separate the species.

This species was found in my study, where it had probably escaped from some of my breeding cages.

E. vagatioella. N. sp.

Palpi with alternate annulations of white and dark grayish brown, five of each color, the tip being white and the base gray brown; face white. Vertex yellowish dusted with grayish brown; antennae fuscous; thorax dark brown and white, about equally intermixed; primaries dark brown faintly dusted with white, the dorsal margin being white, dusted with dark brown, especially towards the apex, where it might more properly be called brown streaked with white. There is an irregular indistinct whitish streak on the costa near the base, and a white spot on the extreme costa behind the middle; the white color prevails in the apical portion of the costal margin, but is dusted with brown, and the apex is white with a rather large dark brown apical spot or patch. Cilia pale grayish dusted with white. Legs and under surface whitish, with patches of grayish brown. *Al. ex.* ½ inch. Kentucky.

HELICE, *gen. nov.*

This genus and the species on which I have founded it approaches *Trypanisma* Clemens, *Gelechia difficilisella,* and more remotely *Agnippe* and *Evippe.*

Wings horizontal in repose. Primaries lanceolate; the costal attains the margin before the middle; the subcostal sends to the costal margin two branches before the end of the cell, one from the end, another behind it and becomes furcate before the tip, delivering a branch to each margin.

Cell narrow, closed by a short, oblique, and faint discal vein. The median sends a branch to the dorsal margin before the end of the cell, and becomes furcate behind it. Submedian furcate at base.

Secondaries narrower than the primaries, apex long and sharply pointed, with the posterior margin suddenly and deeply incised beneath it and the anal angle rounded; costa emarginate from the middle to the apex. The costal vein attains the margin about the middle. Subcostal straight, attaining the margin just before the tip. Median dividing into three branches. Cell unclosed. (In *Trypanisma* Dr. Clemens says the cell is closed by a faint discal nervure, but I have not been able to detect it in this genus, nor in *Evippe*, *Agnippe* or *G. difficilisella*, all of which are closely allied to *Trypanisma*.) *T. prudens*, Clem., I have never seen. *Evagora*, Clem., belongs to the same group.

Tongue scaled, longer than the anterior coxæ. Maxillary palpi small but distinct under the lens; labial palpi long, slender, over-arching the vertex, with the third joint almost acicular and longer than the two others united; the second joint is laterally slightly compressed and slightly thickened towards its apex. Antennæ simple, about two-thirds as long as the wings. Head and face smooth. Vertex short and face scarcely retreating.

H. pallidochrella. N. sp.

Head, thorax and primaries pale grayish ochreous, minutely dusted with fuscous. Primaries with a large transverse dark brown spot before the middle and a smaller one behind it, both appearing bronzy in some lights. Cilia reddish yellow; palpi dusted with pale fuscous; antennae annulate with dark brown. *Al. ex.* ⅓ inch. Kentucky in June.

ŒCOPHORA ? Zell.

I am not certain that the insect described below is properly included in this genus, though it approaches closely to it. It is also very near to *Callima* Clem., but I do not feel satisfied that *Callima* should itself be separated from *Œcophora*, and Dr. Clemens seems to have entertained the same doubt when he diagnosed the genus.

The following are the generic characters of this species :—

Primaries lanceolate; the costal vein attains the margin about the middle; just before the middle the subcostal sends a slightly sigmoid vein to the margin and from near the end of the cell two other shorter branches,

and proceeds to the *dorsal margin at the apex.* The discal cell is wide towards the end and the subcostal comes down obliquely towards the middle of the wing, from its second branch to its apical one. The cell is closed by a curved discal vein which gives off two branches to the dorsal margin. The median vein is nearly straight to the end of the cell, where it is deflexed to the dorsal margin, after having given off two branches from near the end. The median is furcate at the apex and attains the dorsal margin about the middle.

(This description is according to Dr. Clemens' system of nomenclature of the neuration. A more intelligible description, with the sketch of the wing before me, would be—median nearly straight to the end of the cell, which is widest near the end and is closed by the oblique curvature of the costal vein to its junction with the median. Nine branch veins are given off from the cell, the first from about the middle of the subcostal and three others from about the end of the cell, all going to the costal margin, the last one at the apex ; four other branches to the dorsal margin from about the end of the cell, and one from the median before the end of the cell.)

Posterior wings lanceolate, or rather wedge-shaped, the costa slightly excised from the apical third ; the costal vein attains the margin at the excision ; the subcostal distinct from the end of the cell to the apex, faint before the end of the cell ; the discal cell closed by a faint rather long oblique discal vein which gives off two branches to the dorsal margin, the superior branch being faintly continued through the cell to the base, the inferior branch is given off close to the median, which is three branched, the two last being approximate in their origin ; submedian distinct ; cell very wide.

Œ. boreasella. N. sp.

Palpi reddish brown ; antennae dark brown, annulate with white Primaries bright golden ; a reddish brown spot margined behind with white crosses the base and is continued along the *extreme* costa nearly to the apex. About the basal fourth is a large costal red brown spot white margined behind, and about the middle is a larger one margined with white before and behind ; opposite the space between these two spots is a larger dorsal red brown spot, white margined before and behind, its white margin being continuous with the white margin of the second costal spots. It is also connected with *each* of the costal spots by a narrow red

brown line. These spots are all large. A rather wide red brown line extends around the apex at the base of the ciliae, and is connected about the beginning of the *dorsal* ciliae with the second *costal* spot by a short somewhat oblique red brown line. The shape of the two costal spots and the dorsal one and the oblique line just mentioned is such as to include between the *three* spots on the costal margin a nearly oval transverse golden yellow patch, and to divide the apical portion of the wing into two nearly circular golden yellow patches, the largest of which is on the costa and has a small red brown spot near its centre, and this central spot is connected with the red brown of the apical margin by a line of mixed white and brown scales. Ciliae golden yellow. *Al. ex.* ⅜ inch.

Since the preceding description was written I have carefully examined fresh specimens of *C. argenticinctella* Clem., and I fail to discover wherein it differs from *Œcophora.* The neuration is exactly that of *Œ. pseudospretella* as figured by Mr. Stainton in *Ins. Brit. v. 3. Œ. borecasella* only differs in having the apical branch of the subcostal of the primaries simple instead of furcate.

LIST OF COLEOPTERA OF ST. LOUIS COUNTY, MISSOURI.

BY S. V. SUMMERS, M. D., NEW ORLEANS, LA.

(Continued from Page 170.)

STAPHYLINIDÆ.

FALAGRIA, *Mann.*
dissecta, *Er.*
venustula, *Er.*
bilobata, *Say.*
cingulata, *Lec.*
HOPLANDRIA, *Kraatz.*
pulchra, *Kraatz.*
HOMALOTA, *Mann.*
trimaculata, *Er.*
aemula, *Er.*
dichroa, *Grav.*
HOMALOTA, *Mann. (continued.)*
recondita, *Er.*
lividipennis, *Mann.*
opacula, *Fauvel.*
TACHYUSA, *Er.*
rigrilla, *Lee.*
ALEOCHARA, *Grav.*
fuscipes, *Fab.*
var, lata, *Grav.*
bimaculata, *Grav.*
opaca, *Fauvel.*

ALEOCHARA, *Grav. (continued.)*
picea, *Fauvel.*
binotata, *Fauvel.*
puberula, *Klug.*
GYROPHAENA, *Mann.*
vinula, *Er.*
dissimilis, *Er.*
socia, *Er.*
DINOPSIS, *Matth.*
americanus, *Kraatz.*
LEUCOPARYPHUS, *Kraatz.*
silphoides, *Kraatz.*
COPROPORUS, *Kraatz.*
ventriculus, *Kraatz.*
laevis, *Lec.*
scitulus.
TACHINUS, *Grav.*
nebulatus, *Fauvel.*
fimbriatus, *Grav.*
TACHYPORUS, *Grav.*
jocosus, *Say.*
maculipennis, *Lec.*
acaudus, *Say.*
brunneus, *Er.*
cribricollis.
CONOSOMA, *Kraatz.*
crassum, *Lec.*
basale, *Er.*
scriptus, *Fauvel.*
BOLETOBIUS, *Leach.*
niger, *Er.*
pygmaeus, *Mann.*
cinctus, *Er.*
cincticollis, *Er.*
dimidiatus, *Er.*
BRYOPORUS, *Kraatz.*
flavipes, *Lec.*
rufescens, *Lec.*
testaceus, *Lec.*
MYCETOPORUS, *Mann.*
americanus, *Er.*
ACYLOPHORUS, *Nordm.*
flavicollis, *Sach.*
pronus, *Er.*
QUEDIUS, *Steph.*
fulgidus, *Er.*
capucinus, *Er.*
molochinus, *Er.*
caenobita, *Fauvel.*
ferox? *Horn.* (specimen lost.
CREOPHILUS, *Steph.*
villosus, *Kirby.*
LEISTOTROPHUS, *Perty.*
cingulatus, *Kraatz.*
STAPHYLINUS, *Linn.*
maculosus, *Grav.*
cinnamopterus, *Grav.*
vulpinus, *Nordm.*
badipes, *Lec.*
mysticus, *Er.*
tomentosus, *Grav.*
cicatricosus, *Lec.*
OCYPUS, *Kirby.*
ater, *Er.*
BELONUCHUS, *Nordm.*
ephippiatus, *Er.*
PHILONTHUS, *Curtis.*
cyanipennis, *Er.*
aeneus, *Nordm.*
hepaticus, *Er.*
blandus, *Er.*
ventralis, *Nordm.*
promtus, *Er.*
debilis, *Er.*
palliatus, *Er.*
thoracicus, *Er.*
lomatus, *Er.*
micans, *Nordm.*

PHILONTHUS, *Curtis.* *(continued.)*
fulvipes, *Nordm.*
brunneus, *Er.*
aterrimus, *Er.*
confertus, *Lec.*
apicalis, *Er.*
sobrinus, *Er.*
pæderoides, *Lec.* (pictus, *Fauvel.*)
quadricollis, *Fauvel.*
mylabrinus, *Nordm.*
atomus, *Grav.*
noviboraensis—*(Horn ?)*
XANTHOLINUS, *Serv.*
obsidianus, *Mels.*
cephalus, *Say.*
emmesus, *Say.*
pusillus, *Sachse.*
LEPTOLINUS, *Kraatz.*
ruficollis, *Lec.*
DIOCHUS, *Er.*
schaumii, *Kraatz.*
LATHROBIUM, *Grav.*
concolor, *Lec.*
punctulatum, *Lec.*
puncticolle, *Kirby.*
brevipenne, *Lec.*
armatum, *Say.*
tenue, *Lec.*
collare, *Er.*
longiusculun, *Er.*
dimidiatum, *Say.*
nigriceps, *Dej. Cat.*
rubripenne, *Fauvel.*
CRYPTOBIUM, *Mann.*
bicolor, *Er.*
melanocephalum, *Er.*
sellatum, *Lec.*
CRYPTOBIUM, *Mann.* *(continued.)*
pallipes, *Nordm.*
badium, *Er.*
despectum, *Lec.*
latebricola, *Nordm.*
STILICUS, *Latr.*
angularis, *Er.*
dentatus, *Er.*
LITHOCHARIS, *Er.*
corticina, *Er.*
confluens, *Er.*
ochrea, *Grav.*
SUNIUS, *Steph.*
prolixus, *Er.*
linearis, *Er.*
binotatus, *Er.*
longiusculus, *Er.*
monstrosus, *Lec.*
PAEDERUS, *Grav.*
littorarius, *Grav.*
PINOPHILUS, *Grav.*
picipes, *Er.*
parcus, *Lec.*
opacus, *Lec.*
PALAMINUS, *Er.*
testaceus, *Er.*
STENUS.
semicolon, *Lec.*
punctatus, *Er.*
colon, *Say.*
stygicus, *Say.*
colonus, *Er.*
egenus, *Er.*
annularis, *Er.*
arculus, *Er.*
chalceus, *Fauvel.*
juno—

(To be Continued.)

INSECTS OF THE NORTHERN PARTS OF BRITISH AMERICA

COMPILED BY THE REV. C. J. S. BETHUNE, M. A.

From Kirby's Fauna Boreali-Americana: Insecta.

(Continued from Page 132.)

312. COCCINELLA QUINQUE-SIGNATA *Kirby*.—Plate vii, fig. 1. Length of body 3 lines. A single specimen taken in Lat. 65°.

Body oblong-hemispherical, very minutely and thickly punctured; underneath black and a little downy. Head black with an acute white spot in the forehead between the eyes; antennae obscurely rufous, dusky at the base and tip; prothorax black, anterior angles and intermediate streak white; elytra tawny yellow with an abbreviated band common to both at the base, an oblique discoidal abbreviated band and apical dot, black; four distant lateral triangular white spots mark the breast.

313. COCCINELLA QUINQUE-NOTATA *Kirby*.—Length of body 3⅓ lines. A single specimen taken in Lat. 54°. Taken also by Dr. Bigsby in Canada.

]231.] Very like the last, but shorter and more hemispherical. Two subtriangular transverse spots between the eyes, apex of the nose, dot at the sinus of the eyes, and anterior angles of the prothorax whitish-yellow; basal band of the elytra broadest at the suture, the two other black spots are of equal size and placed transversely, and each forms an abbreviated band, falling far short of the suture and the lateral margin, so as to be scarcely more than two transverse spots; scutellar angle of the elytra paler than the rest: the breast has no white spots. In other respects it is exactly like *C. 5-signata*.

314. COCCINELLA TRICUSPIS *Kirby*.—Length of body 2¼ lines. Several specimens taken in the Journey from New York to Cumberland-house.

Body black, punctured. Head with two irregular transverse yellow spots between the eyes; antennae pale rufous, black at the tip: prothorax with the anterior angles and a slender portion of the anterior margin

yellow, the black part forming a large three-lobed spot; the middle lobe being the longest and truncated, the lateral ones shorter and rounded; elytra tawny-rufous, paler and almost yellow at the base and sides, where there is a black band common to both elytra not reaching the lateral margin, which anteriorly has a double sinus so as to form three triangular lobes or points in the band; towards the apex of each elytrum is another irregular black band, which reaches neither the suture nor the margin.

315. Coccinella incarnata *Kirby*.—Plate vii, fig. 7. Length of body 2 lines. A single specimen taken in Lat. 65°.

[232.] Body black. Mouth and its organs and antennae reddish; prothorax flesh-coloured with two large subquadrangular black spots, separated by a narrow flesh-coloured stripe, which occupy almost all the disk: elytra flesh-coloured, taken together with eleven roundish rather large black spots, three of which are common to both elytra, viz. 3, 4, 3, 1, the common spot at the apex is transverse; legs black with the base of the thighs and tibiae, tarsi, sides of the abdomen, and anus testaceous.

This species seems to come near *C. borealis* of Thunberg, but it differs in colour and the number and disposition of the spots.

FAMILY PIMELIADÆ.

316. Pimelia alternata *Kirby*.—Plate v, fig. 9. Length of body 6½ lines. A single specimen taken at Carlton-house, Lat. 53°, in April.

[233.] Body dull-black, oblong, naked. Head minutely punctured; antennae shorter than the prothorax; prothorax widest in the middle, subquadrangular with the sides rounded, minutely but not very thickly punctured, with some slight impressions in the disk: scutellum short, wide, rounded at the apex; elytra with six elevated granulated lines alternately more pronounced, besides the suture and marginal one separating the epipleura, which meet just above the apex; epipleura granulated: posterior legs much longer than the four anterior.

Mr. Say says of his *P. rotunda* that it was the first of that genus found on the New Continent; that above described furnishes therefore a valuable addition to the American insect Fauna. Africa appears to be the metropolis of the genus, though several species have been found in Russian Tartary.

[A species of *Eleodes*, synonymous with Say's *Eleodes (Blaps) tricostata.*

FAMILY TENEBRIONIDÆ.

317. UPIS CERAMBOIDES *Linn.*—Length of body 8–8½ lines. A pair taken in the month of April, in Lat. 65°. Taken also in Canada by Dr. Bigsby. [Abundant throughout Canada; taken by Agassiz's Expedition on Lake Superior.]

Body dull-black, narrow, naked, minutely punctured. Head nearly round depressed, porrected; eyes lateral, kidney-shaped; nose circumscribed by the segment of a circle; antennae a little shorter than the prothorax, joints obconical, four last lentile-shaped; prothorax a little wider than the head, oblong with rounded sides; scutellum rounded at the apex; elytra taken together wider than the prothorax, a little dilated beyond the middle, and then sloping to the apex, which is acute; very unequal with numerous irregular deep impressions and rugosities, variously separated by a number of elevated lines or obtuse ridges running confusedly in various directions; legs long; thighs incrassated; tibiae and tarsi slender.

[234.] 318. TENEBRIO MOLITOR *Linn.*—Length of body 7½ lines. Taken in Nova Scotia by Capt. Hall.

Body oblong-linear, minutely and numerously punctured, a little glossy, naked, above piceous, underneath rufo-piceous. Head uneven, nearly orbicular; anteriorly rufo-piceous; antennae and palpi rufo-piceous; prothorax transverse, sides rounded with a reflexed margin; posterior margin wavy, just above which, on each side, is a roundish impression; posterior angles acuminate: scutellum transverse, subacuminate: elytra scarcely wider than the prothorax, slightly furrowed, furrows punctured with the interstices transversely somewhat wrinkled, and most numerously and minutely punctured; shoulders short, compressed and incrassated; cubit curved.

[An introduced European species that has spread all over Canada and the Northern States, and has become a great pest to millers, flour dealers and house-keepers.]

TENEBRIO PENNSYLVANICUS *Knoch.*—Length of body 8–9 lines. Several specimens taken in Lat. 54°; it was also sent me by Dr. Harris.

[235.] Body long, rather widest towards the anus, black, minutely punctured, naked, not glossy. Head somewhat quadrangular, longer than in the preceding species, uneven; prothorax nearly square with a minute impression above the scutellum; posterior margin wavy; lateral very slender and a little rounded; scutellum subtriangular; elytra with nine rows, including the marginal one, of punctures, and an abbreviated one at the base next the suture; under a powerful lens the interstices are minutely but not thickly punctured: the shoulders are scarcely thicker than the thighs.

[Belongs to *Nyctobates* Guen.; very abundant throughout Canada.]

ANNUAL MEETING OF THE ENTOMOLOGICAL SOCIETY OF ONTARIO.

The third annual general meeting of the Society was held at the rooms, London, Ontario, on Thursday afternoon, Sept. 25th, 1873. The President, the Rev. C. J. S. Bethune, M. A., in the chair.

The minutes of the previous meeting were read and confirmed.

The Secretary-Treasurer then read the financial statement, showing a balance of $171.27 on hand.

On motion this report was received and adopted.

The President then delivered his annual address, a copy of which will be found on another page.

Officers for the ensuing year were then elected, as follows:—

President, Rev. C. J. S. Bethune, M. A., Port Hope; Vice-President, Mr. E. B. Reed, London; Secretary-Treasurer, Mr. Joseph Williams, London. Council—Mr. Wm. Saunders, London; Mr. R. V. Rogers, Kingston; Rev. Canon Innes, London; Mr. Geo. W. Bowles, Montreal; Mr. J. M. Denton, London. Auditors—Mr. C. Chapman, London; Mr. J. H. Griffiths, London.

The Secretary read a letter from Mr. Caulfield, of Montreal, on behalf of the Entomologists resident there, requesting permission to form a Branch Society in that city. This was most cordially given, and the Secretary was instructed to convey to Mr. Caulfield the best wishes of the parent Society for the future success of the Montreal Branch.

The Rev. C. J. S. Bethune having declined to act as Editor any longer, Mr. Wm. Saunders was appointed in his stead.

The following Editing Committee were duly elected: Rev. C. J. S. Bethune, M. A., and Messrs. Reed and Williams.

In accordance with clause 2, section 2 of the Constitution, the two following gentlemen were elected Honorary Members: Mr. V. T. Chambers, Covington, Kentucky; Mr. P. R. Uhler, Baltimore, Maryland.

The following were elected Ordinary Members: Mr. John Wilkie, Guelph; Mr. William McAllan, Woodstock; Mr. Samuel Anderson, Wyoming,

A communication was read by the President in regard to the following resolutions, passed at the late meeting of the American Association for the Advancement of Science:—

"We, the undersigned Entomologists, assembled at the 22nd meeting "of the Amer. Assoc. for the Advancement of Science, held at Portland, "hereby respectfully petition the American Entomological Society of "Philadelphia, and the Entomological Society of Canada, to appoint "yearly meetings to be held at the same times and places with the annual "meetings of the American Association. The undersigned are moved to "this memorial from the considerations, that such prospective action of "the Societies would ensure the annual assemblage of a large number of "Entomologists resident over a wide extent of territory, and also prac- "tically enlarge the sphere and increase the usefulness of these Societies."

"Resolved—That the American Association for the Advancement of "Science hereby endorses the accompanying memorial, and invites the "Entomological Societies to call yearly meetings of their members in "accordance with the request therein contained."

After some discussion Mr. Saunders moved, seconded by Mr. E. B. Reed—"That the Entomological Society of Ontario has heard with much "pleasure the above resolutions of the American Association for the "Advancement of Science, and will gladly do everything in its power to "carry out the proposed arrangements and facilitate the annual meeting "of American Entomologists."

"That we hereby tender our hearty thanks to the American Association "for their cordial invitation, and that the Secretary be requested to "forward a copy of this resolution to the above Association."

EDITORIAL SUMMARY.

In the *American Naturalist* for September we find two very interesting papers on Entomological subjects. The first by Prof. C. V. Riley, on "Controlling Sex in Butterflies," in which he shows, we think pretty conclusively, by the results of a number of experiments which he has instituted, that the theory advanced by Mrs. M. Treat in the March number of the *Naturalist*, to the effect that the relative proportions in the sexes of butterflies can be controlled by the quantity of food given, is untenable. Mrs. Treat contended that by half starving a brood of larvæ you would obtain as a result either exclusively males or a very large proportion of such, while by liberal feeding the reverse would be the case, the gentler sex greatly preponderating. Prof. Riley thus sums up his results: "On the whole, if these experiments indicate anything, they indicate that where more males than females are obtained from stinted larvæ, it is attributable to the fact that the females, being largest and requiring most nourishment, succumb most readily under such treatment; rather than that the sexual characteristics are modified and determined by such treatment."

The second paper is the "Third Annual Report on the Injurious and Beneficial Insects of Massachusetts," by A. S. Packard, Jr.

The author states that at a low estimate there are probably upwards of 50,000 species of insects in the United States, the proportions in the different families being roughly estimated as follows:—Hymenoptera (bees, wasps, ichneumon flies, sawflies, &c.,) 10,000; Lepidoptera (butterflies and moths,) 5,000; Diptera (two-winged flies,) 10,000; Coleoptera (beetles,) 10,000; Hemiptera (bugs, &c.,) 10,000, with several thousand species of Orthoptera (grasshoppers, &c.,) and Neuroptera (dragon flies, caddis flies, &c.) A large number of these insects are as yet undescribed, so that in the mere determination, classification and arrangement of these vast hosts of animated creatures, an immense task has to be performed for which the present number of working Entomologists is entirely insufficient, there being, the author states, but about thirty in this country who publish anything relating to insects. Hence the more important work of studying the history and habits of the various species is necessarily very much interfered with.

With regard to insectivorous birds it is said that they seem to have certain fancies of their own as to what they will eat among insects. The canker-worm, which appears to be avoided by most birds, is eaten in large numbers by doves, and the martin will store up in its nest quarts of the common striped beetle of the potato, to the exclusion of other insects.

Some interesting details are given in reference to the history and mode of life of the May Bug, *Lachnosterna fusca*, and also the Goldsmith Beetle, *Cotalpa lanigera*, both destructive to the roots of the strawberry. The Bean Weevil, an insect which seems to be largely on the increase in New England, is noticed, and some suggestions given in regard to checking its further spread. The seventeen year Locust and other species of Locusts are also referred to, as well as several other less injurious as well as beneficial insects.

A Distinguished French Visitor.—At the September 9th meeting of the Philadelphia Academy of Natural Sciences, among the distinguished visitors present were Prof. C. V. Riley, of St. Louis, and Dr. J. E. Planchon, professor of botany at Montpellier in France, the latter of whom is now in this country under authority of the French Government, to investigate our grape diseases. By invitation of the President, Dr. Ruschenber, Prof. Riley gave an account of the *Phylloxera* or grape vine root-louse, with his most recent discoveries in regard to the same. He had little doubt but the insect was at the root of most diseases that attack the grape in this country, as it was certainly in Europe. Prof. Leidy inquired of Mr. Riley the true position of the insect in scientific classification; Prof. Riley replied that it was not yet well settled. Its appearance brought it somewhere near the aphids, but it did not have successive broods from one impregnation; aphids did. In this respect it approaches *Coccus*. He thought it between the two families.

Prof. Planchon described the ravages of the insect on the grape-roots in France, and thought them less destructive on the roots of American species of grapes than the European; and one of the objects of his mission was to ascertain this fact definitely, so that in Europe some American vines might be used as stocks for their vineyards.

It was clear from the fact, that the European vines had been but recently attacked by it, and had suffered so severely from it; while in America—the home of the insect—the wild vines had done tolerably well

for so many ages, that the *Vitis vinifera* with it was more of a favorite. He excused himself from any lengthy remarks on account of his limited English, and would briefly say that he agreed entirely with Prof. Riley's views regarding it.

Mr. Thomas Meehan gave a history of grape-culture and grape-diseases in Pennsylvania from the earliest time to the present, and showed that the failures had never been satisfactorily explained on any theory sometimes given, such as change of climate, or depletion of the soil. There were always some facts or figures which rendered every previous theory inadmissable to his mind, as he had frequently stated in other places. Prof. Riley's insect discovery, however, met all the requirements of the case, so as to give an air of possibility to Mr. Riley's views, such as no other theory has possessed. That when we saw the foreign grape and others which often did perfectly well for years in one locality, and then failed, it seemed absurd to suppose that the climate or soil suddenly gave out; but a sudden incursion of a brood of root-insects was a cause that could have such a sudden effect.—*Gardener's Monthly.*

Leaf-cutter Bee.—For five summers a rose-leaf-cutter bee has built her nest in a narrow-spouted watering-pot in my garden, and I have just heard of another nest, found in the touch-hole of a gun belonging to our volunteer artillery. My books on entomology only mention these bees' nests as found in earth or cavities of walls; therefore I venture to record the above as rather unusual localities.—*F. C. in Hardwicke's Science Gossip.*

ADVERTISEMENTS.

Exchange.—I am desirous to exchange English for Canadian or American Lepidoptera. I should also be glad to exchange living pupæ of many British Lepidoptera for pupæ of American species. J. C. Wasserman, Beverly Terrace, Cullercoats, North Shields, England.

Coleoptera for Sale.—A number of Rocky Mountain Coleoptera will soon be for sale in sets by John Akhurst, 19, Prospect Street, Brooklyn, N. Y.

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The Canadian Entomologist.

VOL. V. LONDON, ONT., NOVEMBER, 1873. No. 11

ON SOME OF OUR COMMON INSECTS.

9. *THE DRAGON FLY—Libellula trimaculata, DeGeer.*

BY J. WILLIAMS, LONDON, ONTARIO.

This insect belongs to the order Neuroptera, which term signifies nerve-veined, so called in consideration of the netted structure of the wings. The members of the particular family *(Libellulidæ)* to which our specimen belongs, rival many of the Butterflies in their graceful shapes and brilliant colouring, while they excel them in rapidity of flight. These insects have received various popular names in different countries—the French call them Demoiselles, the Germans Florfliegen or Gauze-flies, or Wasserjungfern or Virgins of the Water, while the English style them Dragon-flies, Horse-stingers or Devil's Darning-needles. The English terms, although lesss poetical than those of our European friends, are, we believe, in a measure, more appropriate to the private character of these insects, who fully earn the title of Dragon-flies, although they are not Horse-stingers ; of the third title we can say nothing.

Our specimen, *Libellula trimaculata* (fig. 19) when full grown, may

Fig. 19.

be described as follows :—The body is much elongated and cylindrical, and attains a length of two inches, in average specimens. The head is

large and bears two very large and prominent compound eyes. These eyes, which consist of many thousand facettes each, are so large that they meet on the upper surface of the head. This great power of vision is still increased by three simple eyes, or ocelli, situate on the upper surface of the head. From the front part of the head project two short, tapering antennae. The mouth occupies the front under surface of the head, and is a most formidable structure. The upper lip is broad, and conceals very powerful toothed organs, called mandibles; other organs of the mouth are also armed with strong teeth which enable the creature to satisfy its carnivorous desires. The most remarkable portion of the mouth, however, is the lower lip, a large, flat, lobed organ, closing the mouth from the under side, and which may be projected forward to a comparatively great distance when attacking other insects.

The thorax, or middle portion of the body, is three or four times as long as the head, and very much greater in diameter. It resembles the head in colour, being a medium chocolate shade, and is sparsely clothed with very short hairs of the same hue.

The abdomen, or posterior part of *L. trimaculata* tapers very gradually to the end, and is much smaller in diameter than the thorax, but more than twice its length. The colour is slightly paler, and is relieved by a line of pale yellowish blotches along each side, which gradually become smaller in size toward the end of the body. The upper surface is arched, while the under is flattened.

The legs are six in number, and are attached three to each side of the lower surface of the thorax.

The wings, which are four in number, are attached two to each side of the upper surface of the thorax, and are about one and a quarter inches long, and three eighths to nearly half an inch in breadth; the front ones being slightly the narrowest. The substance of the wings is a very delicate net-work covered by a thin transparent membrane having a shining surface. From the place of attachment of each wing there proceeds a narrow elongated patch of a deep brown colour, while from about the middle of the wings there is a large irregular patch of the same colour, which extends completely across. The structure of the wings combines great strength with lightness, thereby enabling the insect to fly with very great rapidity. Their shining surface, transparency, and brilliant colouring in this and other members of the same order, combine to give them a

beautiful appearance when flying in the bright sunshine, and evidently suggested the popular names given to them by the French and Germans.

The Dragon-fly is usually found in the vicinity of small streams or ponds, for reasons we will soon give. On bright and warm days in July and August it may be seen skimming over the surface of the water or ascending in graceful curves into the air, in search of food. When it rests, its wings are expanded horizontally.

Notwithstanding their graceful and "Demoiselle" appearance, they are most bloodthirsty creatures. Their rapid flight and enormous range of vision enable them to capture other insects with ease, while, their taste not being limited, they can consume butterflies, moths and other insects without compunction, and they are known to destroy and eat each other, as well as very small fishes (Figuier). However, it is this ravenous propensity which makes this insect so very valuable to man, as they destroy immense numbers of other insects which are injurious to vegetable and other products, and do not injure these substances themselves. A few of them shut in a house will soon rid it of flies, bugs and mosquitoes, and therefore their presence should be welcomed. The popular opinion that they are dangerous to man is without foundation, as they can neither bite, sting, or poison him.

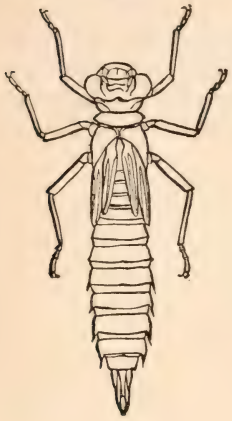
We may now consider the development of *L. trimaculata* from the egg, as it furnishes some very curious and interesting information.

When the female is about to deposit her eggs, she attaches herself to some plant growing out of the water, and pushing her abdomen beneath the surface, glues a bunch of eggs to the submerged stem or leaf (Uhler). These eggs produce larvæ which have a distant and ugly resemblance to the perfect insect. The larva is active and passes its existence in the water, feeding on numerous weaker insects. It possesses a curious syringe like apparatus situated in the end of the body, by which it discharges a stream of water for a distance of two or three inches behind it, thereby propelling the insect forward. The motion thus given is most irregular and appears to be beyond the control of the larva. This curious arrangement serves for respiration as well as locomotion.

The larva soon reaches the pupa state (corresponding to the chrysalis state of a butterfly), in which it is also active, crawling over the bottom of the stream preying on other insects. In this state it is longer than the

larva, and still more resembles the perfect insect. The accompanying figure (No. 20) of a pupa of a species of *Æschna*, nearly allied to *L. trimaculata*, will give an idea of the appearance of that of our Dragon-fly.

Fig. 20.



When about to become a perfect insect, the pupa climbs up some suitable plant near the surface of the water and attaching itself firmly awaits the last great change. In a short time the skin opens down the back, and the adult Dragon-fly, by bending backwards and forwards for some time, emerges. It only requires to remain a few hours till its wings attain their full size and hardness, when it starts off on a life long expedition of plunder.

REMARKS ON RECENT NAMES GIVEN TO SOME LEPIDOPTEROUS INSECTS.

BY H. K. MORRISON, OLD CAMBRIDGE, MASS.

Looking over some recent papers, by one of our most careful and distinguished naturalists, well known by his contributions to all branches of Natural History, but more particularly to Lepidopterists by his *exhaustive* studies on the genera of North American Bombycidæ, we were surprised to see the numerous and apparently unnecessary repetitions of the same specific name in closely allied genera and families.

In a single article on the Phalaenidæ of California, there are in this group alone *ten* species named *Californiaria* or *Californiata*. If the Phalaenidæ were an immense group, containing many distinct generic types but loosely connected by intermediate forms, so large a number of species of the same name would be opposed to all precedent in nomenclature. But, on the contrary, there is no group so compact, none in which the genera are so difficult to define, and united by stronger and

more conspicuous characters. Such being the nature of this group, we would expect at least to find *Californiaria* distributed among the different families, but it occurs in the same family; and in two genera *Tephrosia* and *Boarmia*, so intimately related that only an expert Entomologist can separate them correctly in every instance.

This is not the only case in which this name is repeated by the same author, for in "Contributions towards a Monograph of the Bombycidæ of the United States," *Californica* occurs four times, in the genera *Pyrrarctia*, *Leucarctia*, *Phyganidia* and *Clisiocampa*, the first three of which are in the same family, and would have been referred to the same genus, *Arctia*, ten years ago. Here are fourteen species described by one author under one name, which should not properly have been used at all, for there already exist nine species of Lepidoptera described by previous Entomologists as *Californica*. In a paper on Geometridæ in the 5th Report of the Peabody Academy of Science, we find three species having the name of *Sulphuraria*, which has already been much used in Lepidoptera.

It seems to us that this repetition in species of the same group and country cannot fail to cause confusion, and to render our nomenclature, the condition of which is at present deplorable, still more difficult to straighten out.

There certainly is no warrant in the works of the writers on Lepidoptera for such a proceeding, and Guenee, the great authority for Noctuilites and Phalaenites, is scrupulously careful in this regard, and of the hundreds of species which he described, in not a single instance is the name repeated.

NOTES ON COSMIA ORINA, Guenee.

BY AUG. R. GROTE., BUFFALO, N. Y.

Mr. Wm. Saunders has sent me, under the number 115, specimens of a Noctuid "from larvae found on oak, imago July 19th," which I regard as this species. The moth is variable in general colour and the appearance of the discal spots, and hence Guenée's description will not always literally apply. The only difference of importance I can see is that the two median trapezoidal lines on the fore wings are wider apart on the internal margin than in my specimens of the European *trapezina*. Guenée

mentions this character in his description of *C. orina* in the following words: "les deux lignes medianes fines, blanches, disposees en trapeze plus ouvert par le bas que chez *Trapezina*." Except that the hind wings are paler, I hardly see any other difference and I do not see the discal point beneath. In one specimen the "points terminaux" are "bien marqués," as in the var. A of *trapezina*, but the wings are not "teintés de rouge—brique clair."

ERRATA ET ADDENDA TO MR. GROTE'S PAPERS.

P. 143, line 19, for Basilarclia read Basilarchia.

" " 31, add "Polygonum had been previously used in Botany."

P. 144, line 29, add "Hubner's *cereus* is a South American species. Westwood's *caenius* is our very distinct *pumila*. Hubner does not, in fact, refer to *pumila* at all. It is no part of his genus Polystichtis."

NOTES ON THE LARVA OF COSMIA ORINA, Guen.

BY THE EDITOR.

A smooth, yellowish green larva, found feeding on oak, taken by bush beating, June 20th.

Length nine tenths of an inch, form cylindrical.

Head rather smooth, flattened in front, slightly bilobed, pale whitish green, with a few fine yellowish hairs not visible without a magnifyer.

Body above pale yellowish green, with a dorsal line of yellow, less distinct on the anterior segments, and covered with fine dots and short streaks of yellow, less numerous on second and terminal segments. There are a few fine short yellowish hairs scattered over the surface similar to those on the head. Spiracles small, oval, whitish, encircled with dull red.

Under surface of a slightly darker shade of green sprinkled with many minute yellowish white dots; feet pale and shining, prolegs green, both faintly tipped with brown.

One specimen which entered the chrysalis state on the 24th of June produced the imago on the 18th of July.

THE MILCH-COWS OF THE ANTS.

BY THOMAS G. GENTRY, GERMANTOWN, PA.

The above title, which forms the subject-matter of the present article, is one that has claimed the attention of the most eminent naturalists of all time. Although much has been said and written upon the subject, still there is room for more. As science advances in its onward march new facts are developed ; some of these have a tendency to subvert long established principles, others to confirm pre-existent notions.

It is well known to naturalists and others that the Aphides secrete, or rather excrete a sweet, viscid fluid, which affords a rich repast for various species of ants. Ordinarily these little creatures are visited by the ants upon the tender branchlets and leaves of plants ; but it has been asserted that they even keep them as human beings do cows. By many this has been deemed partly imaginary.

Formerly I was disposed to drift with the popular opinion in this particular, but latterly some few facts, which accidentally fell under my notice whilst searching for Carabs, have confirmed me in the opinion that such is the case in at least one species of *Formica*.

Whilst exploring a neighboring thicket lately, I was led to raise every stone that lay across or on the side of my path, as experience had taught me that the objects of my search were generally to be found in such concealed places. It was on one of these occasions that I noticed a nest of *Formica sanguinea*. Disturbed by this unexpected intrusion, the colony soon presented a scene of activity. My interest being at once excited, I decided to change my occupation for the time, and instantly seated myself down upon a slight mound where I could command a view of the nest, and observe the minutest details of ant life. I was not long in perceiving that the community consisted of full-grown neuters, larvæ in various stages of developement, and a small species of white Aphis that is ordinarily found adherent to the roots of plants. Not a single male or female was to be seen, they doubtless were occupying at the time the subterranean galleries. The working portion of the community was evidently divided into three classes, each having a separate and distinct part to perform. The first class had the exclusive care

of the more matured larvæ; the second the comparatively feeble, and the third the charge of the herds. On the disturbance alluded to, each class immediately set to work in the discharge of its prescribed duty. But as it is to the third class that I shall particularly call attention, I shall be compelled to pass over the two preceding classes, referring your readers to the forthcoming Proceedings of the Philadelphia Academy of Natural Sciences, where their habits will be found minutely detailed.

But now to the third class. When the disturbance took place, its individual members were so intent upon soliciting by their caresses the much coveted sweet, most likely to be used as food for the young larvæ (but this I could not determine at the time), that they did not seem to notice the invasion of their jurisdiction. When fully aware of the fact instead of leaving their flocks at the mercy of the invader, and seeking their own personal safety by flight, each manifested the deepest concern for the little creatures who pandered so willingly to their temporal welfare. As if conscious of the debt of gratitude which they owed to them, they carried them down into their underground dwellings, where they found them comfortable quarters. Here it is plain that these tender creatures receive as much, if not infinitely more, care and attention than man is apt to bestow upon his flocks. Whether they bring the food to them or not it is not my province to say; but this I do affirm, that the galleries of *F. sanguinea*, whenever I have observed plant-lice therein, have always been constructed where these little creatures can find an ample supply of natural food. It may be probable that the lice are carried to the food; but that they are escorted to it by the ants is highly certain, as the slightest disposition to stray away by the more roving ones, is instantly checked. But on the whole, it cannot be denied that under the rule of their peaceful masters—the ants—they lead happy and prosperous lives.

NOTES ON COLLECTING.

BY W. V. ANDREWS, NEW YORK.

I can endorse (not necessary of course) Mr. Mead's "Notes on Collecting," pub. p. 78, vol. 5 of the "Entomologist," with right good will, having used similar methods myself for several years. I think I got my idea from D. Girard Knaggs.

A little improvement, however, may be made. If the collector, instead of putting in his "Cyanide of Potassium" in "lumps," will pound it to a fine powder, intimately mix it with the necessary amount of Plaster of Paris, and then pour in water till the mixture has by stirring assumed the consistency of cream, he will have a more efficacious, as well as a more lasting box (or bottle). When lumps, particularly large lumps, are used, it is difficult without using too much plaster, to cover the cyanide so that it shall not deliquesce. Of course if it begins to do so more and more of the surface is exposed and the box is always damp, and is liable to act on the colors of the captured insects.

Mr. Mead uses a bottle. I use a box. For general purposes the box commonly used for putting up Baking Powders will answer all purposes except in the "Catocala" season. But a box of that size, or as I think of any size, necessitates the making of a larger one on the same plan. That is a "transfer box," which remains in the house, or remains on the hunting ground, according to circumstances.

After making two or three captures from one tree, I never think of injuring the plumage of those by making an addition to them by introducing a lively moth; but immediately remove these to the "transfer box." By the next morning they are in good setting order. Thus I go through the night, the "transfer box" ultimately containing all the captures.

Of course it matters little whether a box or a bottle is used. In fact, it may be well to have a bottle for home service, and a box for the field. A box, as described, is a much better collecting vessel for Coleoptera than any alcohol bottle.

The best "transfer box" that I have ever used is a tin one about six inches in diameter and about two and a half inches in depth—used legitimately, I believe, for holding coffee samples.

Now, all these supposed improvements are based on the idea that having two or more dead moths in your collecting box, the third one, when introduced, will be absurdly lively for a time. This, at any rate, is my experience. The little fellows seem to have no idea of the important part they have to fill in Entomological Science, and dart about in the most reckless manner. Mr. Mead seems not to have met with such an inconvenience, but my captures have been uniformly obstreporous. Besides, I cannot help thinking that to *boulverse* a box of dead moths, say a hundred times a night, must do some little damage to them.

I never met with any inconvenience from ants as Mr. Mead has, but I have met with a rather serious one (because it is almost "morally" impossible to remove it) in the various species of tree toads. Beautiful little fellows, with eyes like diamonds, that will mount your garden fences and snap up unwary Heterocera without compunction. Rather annoying but of course you cannot drive them away.

Mr. Mead says nothing about a light. I advise a *square* tin lantern with a good reflection and some means of shutting off the light, which should be turned on suddenly. A Bulls-eye concentrates the light too much. Strap the lantern around your waist. I like a little rum in the molasses for the moths; and a little for myself.

INSECTS OF THE NORTHERN PARTS OF BRITISH AMERICA.

COMPILED BY THE REV. C. J. S. BETHUNE, M. A.

From Kirby's Fauna Boreali-Americana: Insecta.

(Continued from Page 196.)

FAMILY DIAPERIDÆ.

320. DIAPERIS *(Arrhenoplita)* BICORNIS.—*Oliv.*—Length of body, male 1½, female 2 lines. Several taken in the route from New York to Cumberland-house.

Body punctured, glossy; underneath black, above black-bronzed or green-bronzed. Head of the female transversely impressed between the eyes, unarmed; in the male just behind the eyes is a pair of long cylindrical vertical piceous horns rather paler at the apex, between which is a deep excavation; the nose also at the apex is armed with a pair of minute triangular teeth; mouth, in both sexes, rufous: antennae black with the three first joints attenuated and rufous; prothorax transverse with the sides rounded, posteriorly obtusangular but not lobed; scutellum

triangular; elytra slightly furrowed with the furrows punctured; interstices minutely punctured; anus underneath with two transverse obtuse ridges; legs rufous.

[Belongs to *Hoplocephala* Lap.; quite common in Canada.]

[236.] FAMILY BOLITOPHAGIDÆ.

321. BOLITOPHAGUS CORNUTUS *Fabr.*—Length of body 5 lines. Taken in Canada by Dr. Bigsby, in a Boletus of the birch, near Lake Huron. [Quite common in old dry fungi on trees and stumps. For description and figures see Say's Amer. Entomology, vol. i, p. 114, plate 51. With regard to the orthography of this word, we may mention that the Greek term is *Bolites*, and the Latin *Boletus*; as the termination *phagus* is Greek the generic name of the insect should be written as above, *Bolitophagus*, while *Boletus* is quite correct as applied to the fungus.]

322. BOLITOPHAGUS OBCORDATUS *Kirby.*—Length of body 6¼ lines. Taken in Nova Scotia by Capt. Hall.

Body linear-oblong, pollinose. Head brown-black, subtriangular; labrum ciliated with yellow hairs; antennae black-piceous, last joint smaller than the two antecedent ones, which are bigger than the rest: prothorax brown-black, obcordate with a larger anterior sinus for the head; surface flat, uneven behind from five obtuse ridges, the lateral ones abbreviated, and before from several rounded tubercles: scutellum minute: elytra embrowned with a yellowish tint from lutose scales, anteriorly [237] with three obtuse ridges: the interior one very short; the intermediate one discoidal, abbreviated at each end; and the exterior one reaching from the base to the apical tubercles, of which there are two much elevated, the interior one being the largest and highest; in the interstices there are four rows of deep impressions: the sides of the antepectus are verrucose; the abdomen is black-brown with lutose sides; the disk is longitudinally, densely, and thickly wrinkled, and the sides are verrucose; legs black-brown.

This species differs from the preceding one in the form of the thorax and the clava of the antennae, and ought perhaps to form a subgenus.

[Belongs to *Nosoderma* Esch.: rather rare in Canada.]

FAMILY HELOPIDÆ.

Genus MERACANTHA *Kirby*.—Labrum transverse, scarcely emarginate; labium subtriangular, longitudinally and obtusely ridged in the middle with a deep impression on each side; mandibles bidentate? at the apex; maxillæ mutilated; maxillary palpi first joint minute: second longer than the rest, clavate; third obconical; fourth very large, securiform; labial palpi broken off; mentum trapazoidal; antennae filiform, scape incrassated; pedicel obconical; third joint longer than the rest, subcylindrical, a little incrassated at the apex; fourth shorter than the fifth, subobconical; fifth longer than the subsequent ones, elongate, obconical; 6—10 obconical, gradually decreasing in length, and the 9th and 10th in thickness; 11th ovate acute.

Body ovate, convex, apterous. Head triangular; front elevated on each side at the eyes protecting the base of the antennae; eyes large, lateral, internally emarginate. Prothorax rather wider than long, narrowest anteriorly, subquadrangular; margined on the sides and anteriorly, margin very slender. Scutellum an obtusangled triangle. Elytra with the epipleura narrow, falciform; shoulders incrassated, armed with a tooth; calcaria very short and scarcely visible.

[238.] 323. MERACANTHA CANADENSIS *Kirby*.—Length of body 6 lines. Taken in Canada by Dr. Bigsby.

Body black-bronzed, naked, glossy, punctured: on the upper side of the body the colour is more metallic. Head and prothorax confluently punctured, two last joints of the antennae pale from hairs; elytra slightly furrowed, the sutural and the marginal furrows meeting at the apex and including the rest; furrows punctured; interstices very minutely and thinly punctured; sides of the abdomen longitudinally wrinkled: tooth of the shoulder short and wide, placed a little above the middle.

FAMILY STENOCHIADÆ.

Genus ARTHROMACRA *Kirby*.—Labrum transverse; labium dilated above the insertion of the palpi, subemarginate: mandibles bidentate at the apex; maxillæ bilobed; lobes thick, obtuse; maxillary palpi incurved, four-jointed; first joint minute; second longer than the rest, clavate; third shorter than the fourth, triangular; fourth very large securiform, with the truncature oblique: labial palpi three-jointed, last

joint securiform ; mentum obtriangular ; antennae filiform, eleven-jointed ; scape short, incrassated ; pedicel short, incrassated at the apex ; joints 3—8 obconical, nearly twice the length of the pedicel ; last joint cylindrical, downy, as long as the five antecedent ones taken together.

Body long and slender ; head triangular ; eyes kidney-shaped ; prothorax cylindrical, not wider than the head ; scutellum rounded ; elytra wider than the thorax, linear ; legs slender ; tarsi very long.

[239.] 324. ARTHROMACRA DONACIOIDES *Kirby*.—Length of body 5 lines. Taken in Canada, near Lake St. Clair, by Dr. Bigsby. Specimens also from Massachusetts.

Body black-bronzed with a greenish tint, glossy, with the whole upper surface thickly aud irregularly punctured ; underneath, except the sides of the trunk, impunctured. Antennae much longer than the head and prothorax, scape and pedicel dusky, 3—8 joints tawny-yellow : last joint black, downy ; prothorax nearly cylindrical ; elytra wider than the prothorax, obtuse at the apex ; thighs a little incrassated ; apex of the cubit and tarsi tawny-yellow ; two last joints of the latter dusky.

This singular insect, at first sight, looks very like a *Donacia*, a resemblance merely given by its colour.

[Belongs to *Statyra* Latr. ; previously described as *Lagria aenea* by Say (Am. Ent. i, 191) ; not uncommon in Canada.]

FAMILY CISTELIDÆ.

325. CISTELA ERYTHROPA *Kirby*.—Length of body 5 lines. Taken in Canada by Dr. Bigsby.

Body elliptical, gloss obscured, especially on the elytra, by very short decumbent hairs. Head longitudinally and slightly impressed between the eyes ; antennae longer than the prothorax, reddish brown, with the three first joints rufous : prothorax transverse, anteriorly not wider than the head, posteriorly obsoletely trilobed, and nearly as wide as the elytra ; lateral angles acute ; elytra slightly furrowed ; furrows scarcely punctured ; legs pale rufous ; posterior tarsi long, embrowned.

CORRESPONDENCE.

DEAR SIR,—

In the September number of the "Entomologist" I find my name mentioned as one of a committee appointed by the entomologists at the late meeting of the American Association, at Portland, to codify rules of nomenclature for the guidance of entomologists.

I was not present when this action was taken, and immediately notified the Secretary that I declined to act upon any such committee, which, in my judgment, should only be selected by and among zoologists in general.

SAMUEL H. SCUDDER.

DEAR SIR,—

I have to respond to Mr. Andrews' remarks, by requesting you to publish one of Mr. Strecker's letters to me regarding the species of *Hemaris*. This will show that I could not have known anything of Mr. Andrews. Mr. Strecker, it will be seen, asks my assistance. Possibly Mr. Strecker may have expected I would determine the species as "new," or publish my observations in his very defective work. I knew nothing of the fact that Mr. Andrews expected a dedication, or that I was to do the work of determination to enable Mr. Strecker to perform that graceful office. Mr. Strecker, for his private gratification, has instigated Mr. Andrews to figure in a most absurd manner before the public, and the whole exhibition is arranged for the purpose of bringing Mr. Strecker's indifferent publication into notoriety, at the expense of Mr. Andrews' desires to figure as an Entomological, or other, authority. From the letter following it will appear that Mr. Strecker could not determine the species sent me. For, when the specimens came to hand, "No. 1 Diffinis" was Hemaris tenuis: "No. 2, *like* Diffinis," *was* Hemaris diffinis; "No. 6" was H. uniformis, and, in consequence of my determination, it is so cited in page 12 of Mr. Strecker's work. "No. 4" was not received by me; "No. 3" was my Hemaris marginalis; "No. 5, Thysbe," was not the usual form of that species. None of the species named by Mr. Strecker were correctly determined. Considering that I had written at length on the genera

Hemaris (*Sesia*, Grote, restr.) and Haemorrhagia, and had described six out of the nine species previously catalogued, I was not struck with any impropriety on the part of Mr. Strecker in submitting his material for determination to me. Mr. Strecker's letter is as follows * :

Reading, March 13, 1873.

DEAR MR. GROTE,—

I am in a muddle with my Sesidæ. In your catalogue you have *thetis*, *diffinis*, axillaris, gracilis, buffaloensis, *thysbe*, fusicaudis, Floridensis ; those underscored I know, the others I don't know by a shot and a half. I have read your description of axillaris, and I think I have it, but ain't sure. Here is the way they are in my collection :

1. Diffinis.

2. Like Diffinis, but margin of fore wings slightly scolloped inside.

3. Like Diffinis, but margin acutely dentated inside and broader ; from Michigan.

4. Thetis.

5. Thysbe.

6. Like Thysbe, but margin of wings not dentated inwardly ; abdomen more robust, not so long ; from Labrador. No. 6 may be Buffaloensis ; I thought I had Buffaloensis, but if this be it not, then I have not that species ; can't you get me an example of it and *gracilis?*

What are fusicaudis and Floridensis ? Where can they be seen ? If I could borrow the examples not in my collection I would figure the whole lot of them, all the N. Am. Sesias on one plate, and with your aid in the accompanying text the world might be set to rights on that bothersome genus as far as the N. Am. species are concerned. Can you help me to get the material for my plate ? also, can you tell me what my Nos. 2 and 3 are by what I have written above.

Write soon to yours truly,

HERMAN STRECKER,

Box 111, Reading P. O., Berks C'y, Pa.

I wish, at least for the moment, to "let the whole thing drop together," as Mr. Andrews suggests, with the following note from Mr. Andrews, which is rather different in tone from those printed on pages

* This letter is set up from the original. In Mr. Grote's communication, pp. 176-177, for "Heman's" read everywhere "*Hemaris.*"—ED. CAN. ENT.

177 and 178. It was occasioned by my sending him entire (by the hands of my friend) Strecker's letters to me, showing his entire concealment of Andrews' connection with the specimens, and absence of any restriction as to their use. While Mr. Andrews prints in one style, trying to justify an unprovoked attack, he writes in a different vein. I may be "public property," at least Mr. Andrews says I am, but I certainly am not the *private* property of either Mr. Andrews or Mr. Strecker, as which they would treat me. Mr. Andrews' simile of the five dollar bill enures to my credit, for Mr. Strecker sent me uncurrent ones and I returned good species that will pass current anywhere. Mr. Andrews would quarrel with a man who supplied him with the information by which his doubtful money became genuine. On further provocation I am prepared to furnish additional information relative to this absurdly disgusting plot in which Mr. Strecker is the most to blame, but in the exposure of which he has shrewdly placed Mr. Andrews in the position of suffering most. The "Press Copy" alluded to below was the letter on page 178.

Room 4, No. 117 Broadway, New York, Sept. 18, 1873.

DEAR SIR,—

Enclosed herewith please find Press Copy of a letter I have addressed to the "Canadian Entomologist." In justice to both parties I do not think I can say more or less.

In writing to Mr. Grote you will be kind enough to express my great regret that any occasion should have existed justifying my action in the premises, and my confident belief that he has not wilfully done wrong to me. Yours very truly,

W. V. ANDREWS.

E. L. Graef, Esq., 40 Court St., Brooklyn.

I apologize for taking up so much of your valuable room.

Yours truly,

AUG. R. GROTE.

Our limited space fordids any further continuance of this correpondence.—ED. C. E.

EDITORIAL SUMMARY.

How do Parasitic Insects Detect their Prey?—A variety of opinions have been expressed as to the means by which ichneumon flies and other parasitic insects discover the living objects upon which they seek to deposit their eggs. Some have inferred that this is done by sight, others by smell, or by the operation of some peculiar sense unknown to us. The rapid movements of some of the Hymenopterous parasites which attack caterpillars would rather lead one to suppose that the sense of touch is an agent, if not the sole agent. These flies may be noticed running rapidly up and down leaves and twigs, with vibrating antennae and palpi, sometimes going over very nearly the same ground again and again, which they would hardly do if they chiefly depended upon their eyes; and were any odour given forth which led them to their victims, these flies would hardly wander about in the manner we see. It is quite possible they may detect even the larvae of Tortrices by the feel of the leaf enclosing these, though the larvae themselves are screened.—*F. R. S. C. in Hardwicke's Science Gossip.*

Ants and "the Taint of the Hand."—In *Nature*, July 24, Mr. James D. Hague, writing on the habits of ants, attributes their dislike to the place across which a finger has been drawn to "the taint of the hand."

Now, Sir, I have frequently drawn a line with a piece of chalk across the track of ants, and observed in them the same symptoms of dislike as Mr. Hague's ants showed to the finger-mark.

I have also drawn a small circle with chalk round one or more ants, who will seek a spot untouched by the chalk through which to make their escape; but should there be no such opening, they will presently cross the circle. If, however, this enclosure be made upon a perpendicular wall, &c., they will frequently drop to the ground rather than walk across the line.

Now, as I have never observed this same dislike—exhibited by dropping—of the "taint" when ants have been running over my hands, and as the chalk-line has the same effect as the finger-mark, may it not be something else than the "taint of the hand" to which the ants object when their usual track is interfered with?—*G. E. E., Nature.*

We quote the following from the excellent "Entomological Record," by Prof. Townend Glover, in the monthly report of the Department of Agriculture, Washington, for October, at the same time thanking our esteemed friend for his kindness in sending us so regularly this valuable report :—

"Grape-vine Borers.—Mr. Fred. J. Kron, of Albemarle, North Carolina, in a letter to the Department, complains bitterly of the injury done to all varieties of grape-vines by the grape-vine borer, *Ægeria polistiformis,* described and figured in former reports of the Department (1854. p. 80, and 1867, p. 72.) Mr. Kron states the insect has destroyed for him one hundred and seven varieties of grapes, derived from the Luxembourg, in Paris, including some five thousand vines ; and adds that there is but one variety that has, so far, defied its ravages, and that is the Scuppernong, which flourishes in the midst of the devastation caused by the borer, all around it. Mr. Kron likewise states that he found a Phylloxera on Clinton root, and adds : "The insect has been noticed here for more than thirty years," but he does not complain of its doing much injury."

"In connection with this last-named insect, so destructive to the grape-vines of France, Mr. Gaston Bazille, vice-president of the Agricultural Society of Herault, publishes a remedy for the Phylloxera, which is translated and republished by Mr. Charles V. Riley, in the New York *Tribune,* as follows :"

"Three holes are made around the injured or infested vine, varying the depth according to the nature of the soil, but generally 2½ feet. These holes were made in the experiments reported by means of a pointed iron bar and a heavy maul. A tube, with a funnel attached, is placed in the hole, two ounces of sulphuret of carbon are poured into the tube, which is then closed with a cork. The vapor of the sulphuret of carbon permeates the soil and impregnates all the roots of the vine. The gas engendered (though not the case with the liquid) is not fatal to the vine, but is sure death to the insects. Four ounces of the liquid has been found sufficient for an ordinary vine ; but sprinkling on the surface must be carefully avoided, as it is in such a case very injurious to the vine, whereas a pound may be used in the soil without injury to the roots."

How to Send Objects Through the Post.—I am often grieved, on reading your "notices to correspondents," to see the complaints of articles being received in such a "smashed" state as to be useless ; and

in your number for this month it is recommended to enclose them in a tin box to withstand the energy of the post-office officials. But even that is not safe; for though the said box itself may not be broken by the tremendous whack the said officials usually lay on, yet still, very delicate objects inside may be injured by concussion. In short there is a better way, by which I have sent microscopic objects hundreds of miles and numerous times, without the slightest injury. It is as follows: It is quite a mistake to place stamps upon the box itself. They should be fixed to one of the common luggage labels, which is then attached to the box by a reliable piece of string, so as to separate it from the box by about two inches. The "official" may then whack away at the luggage label to his heart's content, and no harm be done. In this case the box need not be strong; and, to prove this I now send, for your acceptance, a very fine specimen of the *Chirodota violacea*, popularly known as "Pharaoh's chariot-wheels." The containing box, you see, is purposely slight; and yet, I will venture to say, you will receive the slide uninjured; and, if so, I hope you will inform your readers of the fact, and draw their attention to the impropriety of placing their stamps on the box. I will merely add that by the "common luggage label" I mean those made of paper pasted on cloth, and having a small ring at one end. They are sold by the dozen at almost every stationer's shop. I must add that I do not claim the merit of the invention. It is by no means new, but, nevertheless, does not appear to be known to many. One more remark. The address should be written (as you see I have) on the label itself; and, though not absolutely needful, it is a good plan to wrap the box in black paper, which prevents all temptation to stamp it, as in that case the stamp will not be seen.—*H. U. J.*

[Our correspondent is quite right. His frail box reached us safely, and we cannot but be glad of the post-office energy which has happened so fortunately for us!—*Ed. Science Gossip.*]

We heartily concur in the remarks of H. U. J. It is most grievous to have fine specimens so ruthlessly smashed, as we sometimes receive them, beyond any possibility of recognition. We are glad to state that this method of attaching a stout paper-and-cloth label, which we know in this country as a tag, and putting the address and stamps on it, instead of the box, has already been adopted by some of our correspondents. We received a few days since from a friend in San Francisco a box containing

several delicate moths, which, packed with this provision, reached us unhurt.

Having given at pp. 199, on the authority of the "Gardener's Monthly" for October, some remarks on Phylloxera said to have been made by Mr. C. V. Riley, we gladly make room for the following correction in the "Monthly" for November, just at hand:—

"PHYLLOXERA—CORRECTION.—Friend Meehan: In your October issue, speaking of some remarks of mine before the Academy of Natural Sciences, you have the following, the italics being mine:

Prof. Leidy inquired of Mr. Riley the true position of the insect in scientific classification; Prof. Riley replied that it was not yet well settled. *Its appearance brought it somewhere near the aphids, but it did not have successive broods from one impregnation;* aphids did. In this respect it approaches *coccus*. He thought it between the two families.

I am sure I said no such foolish thing. What I did say was that the insect belonged to the sub-order *Homoptera*, and that while it was at present classed with the plant-lice *(Aphididæ)* it bears close relation to the bark-lice *(Coccidæ.)* *Phylloxera* multiplies agamically like all the *Aphididæ*, and therefore does produce successive broods from one impregnation.

Yours truly,

C. V. RILEY."

BOOKS RECEIVED.

Die Larven von Ascalaphus, von Dr. H. Hagen, 8vo., pp. 64.

On the Larvæ of the Hemerobina, by Dr. H. A. Hagen, 8vo., pp. 6.

On the Butterflies of Anticosti, by Aug. R. Grote, 8vo., pp. 1.

Report on Pseudoneuroptera and Neuroptera of North America in the Collection of the late Th. W. Harris. By H. A. Hagen, 8vo., pp. 39.

Revision of the Genera and Species of the Tribe Hydrobiini, by George H. Horn, M. D. 8vo., pp. 20.

Revisionof the Several Genera of Meloidæ of the United States, by George H. Horn, M. D. 8vo., pp. 29.

Contributions to Entomological Bibliography up to 1862, by Albert Muller, F. L. S. Nos. 1 and 2. 8vo., pp. 24.

Catalogue of the Pyralidæ of California, with Descriptions of new Californian Pterophoridæ, by A. S. Packard, jr. 8vo., pp. 15. (From Ann. Lyc. Nat. Hist., N. Y., vol. x, No. 9, 1873.)

Le Naturaliste Canadien, Sept., 1873.

Nature, to October 30th, 1873.

Monthly Reports of the Department of Agriculture, August, September and October.

Bulletin of the Buffalo Society of Natural Sciences, vol. i, No. 3. August, 1873.

Scottish Naturalist, April, July, October, 1873.

Newman's Entomologist, July, August and September, 1873.

Journal of Education, October, 1873.

The Zoologist, August and September, 1873.

Proceedings of the Academy of Natural Sciences, Philadelphia, January and February, 1873.

The Horticulturist, October, 1873.

Entomologist's Monthly Magazine, August, 1873.

American Naturalist, September, October, 1873.

The Canadian Entomologist.

VOL. V. LONDON, ONT., DECEMBER, 1873. No. 12

ON SOME OF OUR COMMON INSECTS.

10. *THE CLOUDED SULPHUR BUTTERFLY—*

Colias philodice, Godt.

BY THE EDITOR.

The clouded sulphur is everywhere one of our commonest butterflies, abundant in its season in fields and roadways, frequently congregating in groups on the borders of streams and springs, where, in hot weather they seem to enjoy settling on the moist ground. They are still more abundant in clover fields as the season advances.

Fig. 21.

Colours, yellow and black.

The female of this species differs somewhat in its markings from the male, as will be readily seen by reference to the figures, 21 representing the female, 22 the male. The ground colour of the wings in both sexes is bright yellow, marked on the outer edge with a dark brown or blackish border, narrower in the male than it is in the female, while in the latter it encloses on the anterior wings a broken row of irregular yellow spots. There is also a spot of black placed near the front edge of the fore wings, about half way between the base and tip, varying in form and distinctness. The hind wings in both sexes are less heavily margined, and near the middle is a dull pale orange spot. Both wings are dusky towards the base, and the fringes are pink.

Fig. 22.

Colours, yellow and black.

On the under surface the yellow colour is less bright, while the dark margins are either entirely wanting or else represented by a dusky shade margined occasionally within by a few dull brownish dots. The spot on the forewings is distinct, but paler and usually centered with a small silvery eye. That on the hind wings is much more distinct than above, being composed of a bright silvery spot in the centre defined by a dark brown line which is in turn encircled with dull orange. Immediately above and a little towards the outer edge is a much smaller spot of the same character; there is also a reddish dot on the anterior edge, about the middle of the wing. The antennæ are pink, with the knobs at their tips of a darker shade; the body is dark above, paler at the sides and underneath.

This insect appears first on the wing about the middle of May, becoming more plentiful towards the latter end of the month, but the time of its greatest abundance is later in the season, during the latter part of July and throughout August. In the second volume of the ENTOMOLOGIST, p. 8, Mr. Bethune remarks as follows: "On the 3rd of August, a lovely, bright, warm morning, after an excessively wet night, I drove about ten miles along country roads; every few yards there was a patch of mud, the effects of the heavy rain, and at every patch of mud there were from half a dozen to twenty specimens of *Colias philodice*, at least one I should think for every yard of distance I travelled. I must then have seen, at a very moderate computation, about ten thousand specimens of this butterfly."

The caterpillar of the Clouded Sulphur feeds on the cultivated pea, on clover, on the Blue Lupin, *Lupinus perennis*, and no doubt on many other plants belonging to the order *Leguminosæ*. The egg is about one twenty-third of an inch in length, tapering at each end, with twelve or fourteen raised longitudinal ribs, with smaller cross lines in the concave spaces between them. Their colour when first deposited is of a pale lemon yellow, which changes in three or four days to a pale red, then gradually to a bright red, and from that to dark brown just before the time of hatching. The duration of the egg stage is about seven days.

The young caterpillar just hatched is one-twelfth of an inch long and of a dull yellowish brown colour, but when a little older it changes to a dark green. When full grown it is about an inch long, with a dark green head and body, the latter with a yellowish white stripe on each side close

to the under surface, with an irregular streak of bright red running through its lower portion. The body also has a downy look occasioned by its being thickly clothed with very minute pale hairs.

The chrysalis is about seven-tenths of an inch long, attached at its base, and girt across the middle with a silken thread. Its colour is pale green with a yellowish tinge, with a purplish red line on each side of the head, darker lines down the middle both in front and behind, and with a yellowish stripe along the sides of the hinder segments.

During the heat of summer the chrysalis state usually lasts about ten days. A day or so before the butterfly escapes the chrysalis becomes darker and semi-transparent, the markings on the wings showing plainly through the enclosing membrane.

NOTES ON THE EARLY STAGES OF SOME OF OUR BUTTERFLIES.

BY W. H. EDWARDS, COALBURGH, W. VA.

I herewith send you some memoranda of what I have done during the past summer, largely owing to the assistance of Mr. Mead. I consider it my most successful season in the way of obtaining larvæ and eggs. One of the most interesting species we discovered was *Lycaena pseudargiolus*. Mr. Mead noticed a female hovering about flowers of *Actinomeris squarrosa*, which is a weed found hereabouts in company with *A. helianthoides*—the last being a thousand-fold most numerous—and suspecting that she was ovipositing, he made a careful examination of the plant. He found several eggs laid directly on the flowers; then capturing two or three of the females, he tied them in a muslin bag over a bunch of these flowers (growing), the result of which was that many eggs were obtained. From those in the bag a few caterpillars were hatched and finally brought to maturity. They fed on the petals of the flowers. It became difficult to obtain food for them, as no plant of *A. squarrosa* could be found in the vicinity of my house, and we tried them on the other species (*helianthoides*), and this answered equally well. Last week the caterpillars that had escaped one accident or another, formed chrysalids in the same flower heads. In summer, as no species of *Actinomeris* is in bloom, the

butterfly must deposit its eggs on some other plant, so that it is evidently much less limited in its diet than many of our caterpillars.

The egg is a beautiful object, blue-green, flattened and depressed at the top, and covered with a net work like lace ; raised on the surface.

The larvæ, when full grown, are a little over one fourth of an inch long and in shape a long oval, the head very small, black, and drawn—when at rest—within the next segment, which falls over the head like a hood. The body is green, dark dorsally, pale at the sides, and is marked dorsally by eight sagittate, tuberculated, yellow-green spots, one on each segment, pointing forwards, and truncated.

The chrysalis is dark brown, covered with minute hairs; of a long oval shape, compressed at the middle. Length $\frac{8}{10}$ inch.

We obtained eggs of *Thecla poeas* also, but only after trying many species of plants, as the food plant of this butterfly was entirely a matter of conjecture. But several eggs were laid on Blackberry. The larvae hatched, but did not eat, and soon died.

Eggs of *Phyciodes tharos* were obtained on grass, after trying the butterfly on every plant we could think of. The eggs were laid on the leaves and stems of a clump of grass placed under a glass jar. Many were laid directly on the sides of the jar. These eggs hatched, but the caterpillars refused to eat.

We had better success with *Phyciodes nycteis ;* a female having been confined with a plant of *Actinomeris squarrosa,* she forthwith proceeded to deposit a large cluster of eggs, about 100, side by side and in regular rows, on the under side of a leaf. The larvæ hatched after a long interval, 13 or 14 days, and we at once from the cuticle of the leaf transferred them to a glass and supplied them with fresh leaves, and in due time the caterpillars reached the third moult. At this they stopped feeding, and are now in a state of hybernation. These caterpillars are dark brown, covered with pencils of short bristles of the same hue, that proceed from longitudinal rows of tubercles. When feeding they consume the whole surface of the leaf, which becomes very filthy from the excrementitious matter mixing with the juices of the leaf. But the caterpillars emerge from the mine as clean as a mole from under the ground.

I have also hybernating specimens of the larvæ of *Diana, cybele* and *aphrodite,* the eggs of which were obtained by Mr. Mead in the same manner. I consider this process of obtaining eggs, provided the food

plant is known, as infallible, and it is sufficient if the butterfly be enclosed in a bag on a limb of the plant, or if a low plant like the grasses, in a bag tied over a few stems or a single stem. I find it preferable to enclosing in a box or keg for the reason that with the latter it is impos sible to avoid the spiders, which destroy eggs and larvæ terribly.

I have succeeded with the Papilio's, all that are found here, as well as with the smaller species.

DESCRIPTION OF NEW DELTOIDS.

BY AUG. R. GROTE,

Curator of Articulata, Buffalo Soc. of Natural Sciences.

Bomolocha scutellaris, Grote.

♀. Larger than *Baltimoralis* and differing at once by the parallel continuation of the transverse lines to the internal margin. The peculiar conformation of the dark median space, described by Guenée as resembling "une espéce de col" in *Baltimoralis*, is therefore wanting in *scutellaris*. Differing from *crassalis*, than which it is larger, by the inner transverse line being incepted on costa and joining internal margin without fusion with the outer transverse line. In coloration *scutellaris* is unusually bright and contrasted. The deep brown median field of the forewings shows the usual black dots. The inner transverse line is edged with white scales outwardly; it is strongly outwardly and obliquely acutely projected below median vein, running more shortly backwards, after the angulation, to internal margin. The basal field is paler brown, much washed with pale and whitish scales inferiorly. The outer transverse line is of the usual general shape, projected medially, even, very slightly notched. Beyond it the subterminal space is whitish, unusually contrasting, crossed by two faint rivulous lines, approximate to, and coincident with, the outer transverse line; the outer of these lines precedes a dusky irregular shade on costa. The subterminal line is white, more continuous than usual, enclosing the usual, but here less obvious and paler dots. The terminal space is pale, whitish above the two usual apical oblique blotches, where the costo-apical dots are marked in brown. Terminal punctiform line distinct, preceded by nervular white marks.

Fringes dark, cleanly cut with pale at the extremities of the veins. Hind wings uniformly dark fuscous, with a neat terminal line. Fringes pale, cut with dark scales; traces of a transverse line apparent on internal margin. Thorax and palpi dark; front and collar with an admixture of pale scales. Abdomen fuscous, the segments finely marked above by pale scales, the three basal segments with dorsal black minute tufts. Beneath pale ochrey fuscous; fore wings dusky within the faintly marked median transverse line, showing the discal dot; subterminal line indicated by costal dots; terminal line neatly indicated on both wings. Hind wings with discal dot and faint transverse median shade line.

Expanse 30 m. m. *Habitat* Albany (O. Meske); Quebec (F. X. Bélanger).

The six North American species of *Bomolocha* I arrange as follows. I recognize Zeller's *achatinalis* as my *madefactalis*. Guenée describes from a figure and I noted that his description did not quite correspond with my specimens, but I was unwilling to bestow a new name. It is questionable whether any of Guenée's descriptions from Abbott's figures should, with propriety, have been written. Mr. Lintner has sent me my dark var. of *Baltimoralis* as "♂ *laciniosa*,"

Bomolocha, Hubner.

Type: *Crambus crassalis*, Fabr.

scutellaris, Grote.
Baltimoralis.
Hypena Baltimoralis, Guenée.
Hypena laciniosa, Zeller.
♀ *Hypena benignalis*, Walker.
abalienalis.
Hypena abalienalis, Walker.
bijugalis.
Hypena bijugalis, Walker.
Hypena pallialis, Zeller.
manalis.
Hypena manalis, Walker.
madefactalis.
Hypena madefactalis, Guenée.
Hypena achatinalis, Zeller.

Hypena olivacea, Grote.

♂. Closely allied to *H. humuli* and *H. evanidalis*, and with the same pattern of ornamentation. The general color is dusky olivaceous, not dusky blackish brown, as in *humuli*, or light rusty brown, as in *evanidalis*, and without the median costal darker shade or apical streak, *evenly* colored. Four raised median black discal scale dots. Two (the reni-

form) approximate, superposed, situate at the extremity of the discal cell, set in a ground of pale scales, surrounded by the here acute outward projection of the transverse posterior line. Two others (the orbicular) further apart, obliquely placed, the lower and outer below the median vein. Both the transverse lines distinct, irregularly zigzag, continued, relieved against pale accompanying shades. Subterminal line apparent by the paler terminal, contrasting with the darker subterminal space, even, a little bent. Terminal dots: the dark fringes marked by paler shades opposite the dots; these paler shades extending on the terminal space before the dots as longitudinal streaks. Hind wings wide, pale fuscous, concolorous, without markings except a very faint relieving of the veins; fringes paler. Beneath obscurely shaded, with a discal dot on secondaries. Head and appendages dusky olivaceous; abdomen like secondaries.

Expanse 28 m. m. *Habitat* Albany (Lintner).

Apparently a smaller form than *H. humuli*, with narrower primaries, and of a peculiarly smooth concolorous dusky olivaceous tint.

SISYRHYPENA, n. g.

Ocelli; eyes naked, without lashes. Labial palpi with the second joint exceeding the front by half its length; third joint long, recurved, about one-third the length of the second joint, slender, more or less pointed, especially in ♀; the palpi are closely scaled. Antennæ (♂) strongly bipectinate; the pectinations are for the most part twice the length of the joints and they are furnished with long terminal spinules and thickly scattered setal hairs. At basal third there is a very slight tuft of scales on the inside, and here the pectinations are reduced in length to the base of the antennus, where they become obsolete, while they are lengthy on the outside. In the female the antennæ are simple. The legs are unarmed. The species is slight; the primaries are narrow, crambiform, drab-colored or brownish with a silky gloss, with inconspicuous and inelegant streaky and punctiform ornamentation.

A low Deltoid genus, perhaps nearest allied to *Tetanolita*.

Sisyrhypena pupillaris,* Grote.

* Spec. sub No. 10, ad cel. Zeller misi.

♂. Concolorous, silky drab, veins tending to be paler marked. Primaries with diffuse darker terminal shading, and a discal narrow outwardly extended streak. An exceedingly fine and faint outer transverse line, rounded opposite the discal cell. A subterminal oblique punctiform line from apices to internal margin within the angle. Costal margin dark shaded. The discal dots are perceivable against the longitudinal discal streak. Hind wings a little paler with a very faint transverse shade line. An interrupted fine dotted line before the silky fringes on both wings. Beneath darker; the hind wings much clouded with dark brownish, with a distinct discal spot and a continued transverse guttiform or cuneiform subterminal line, analagous to the subterminal line of the forewings above; faint traces of an inner transverse line. Forewings without markings except an incomplete reproduction of the subterminal shaded apices. Body parts concolorous; abdomen like hind, thorax like fore wings.

♀. The labial palpi are held as in the ♂, but the third article is more pointed. Slighter than the ♂, with simple antennæ and with almost wholly blackish brown primaries; the ♂ exhibits two transverse lines, while both female specimens have entirely glossy brown forewings without apparent marks except the inconspicuous discal points. Hind wings pale drab with faint darker terminal shading. Beneath the secondaries have the double lines more equally defined. Thorax and head dark, concolorous with primaries.

Expanse, ♂ 21 to 23 m. m. ♀ 21 m. m. *Habitat,* Philadelphia, one ♂; Texas, one ♂, two ♀'s. The types are in the collection of the Buffalo Society of Natural Sciences, The Texan male has the primaries darker, more streaked with brownish. This and the slightly smaller size caused me at first to suspect a distinct species in the Texan specimens. The darker greasy tinting of the primaries will probably prove variable in disposition.

SYNONYMICAL NOTE.

Adelocephala albolineata, Grote & Robinson.

Proc. Ent. Soc. Phil., plate i, fig. 7, ♂, vol. 6, p. 7, 1866, has been re-described as follows:

Adelocephala vaspa, Boisduval.

Ann. Soc. Ent. Belg., Tome xv, plate iii, fig. 1, ♀, p. 93, 1872.

MICRO-LEPIDOPTERA.

BY V. T. CHAMBERS, COVINGTON, KENTUCKY.

Continued from Page 176.

ERRATA.—For *Eidothoa*, p. 186, read *Eidothea*.

Since the preceding accounts of the genera *Evippe*, *Eidothea* and *Helice* were sent to the publishers, I have taken a single specimen of the species described below. Its small size, general appearance and the tufts of raised scales at first inclined me to place it near *Laruna*; but a closer examination shows it to belong to the *Gelechidæ*, and to the same group (or subsection of *Gelechia*) with *Evippe*, &c. and *Gelechia difficilisella*. I am not altogether satisfied that I am right in separating these species from *Gelechia*, in the present heterogeneous condition of the group called by that name. But that group is already so large, and contains such a mixed assemblage of small moths, that the existence of such a group is rather a hindrance than an assistance to the student of the *Tineina*, unless, indeed, he is content to use it as a mere limbo to which may be consigned anything allied to the *Gelechidæ* which cannot be satisfactorily located elsewhere.

Neither am I entirely satisfied that I am right in separating these genera, *Sinoe*, *Agnippe*, *Evippe*, *Eidothea*, *Helice* and *Taygete (vid. post)* from each other, so nearly are they related, yet the process of division once begun I have not found it practicable to separate them otherwise than as above indicated.

The species described below resembles *Gelechia difficilisella* and *Helice pallidochrella*, and even *Gelechia obliqui-strigella* in the pattern of coloration. From the latter, however, it is distinct as to the neuration, whilst in this respect it closely resembles the two former, as it does also as to the palpi, whilst it differs from them decidedly by the absence of the tongue. In the hind wings the apical branch of the subcostal is delivered below the tip in this species, instead of at it as in *Gelechia difficilisella*, and in this respect only do the hind wings differ; and the only difference in the fore wings is the wider angle between the first and second branches

of the median in this species than in *difficilisella*. I should certainly have considered them congeneric, but for the absence of the tongue in this species, which likewise has raised tufts upon the fore wings. So close is the resemblance otherwise, and so rare the occurrence of a species allied to *Gelechia* without a tongue, that I suspected it might have been broken off; but I could discern no vestige of it, and the adjacent parts were uninjured. Both in this species and in *G. difficilisella* the terminal joint of the palpi is decidedly shorter than the second, which is scarcely thickened towards the apex. The characters of *G. difficilisella* as given *ante v. 4, p. 192*, will answer for those of this genus, with the changes above suggested. The form of the wings and neuration of *Evippe* are the same, except that the subcostal vein of the hind wings attains the costal margin *before* the apex, instead of attaining the apex as in *difficilisella*, or the dorsal margin as in this genus, and does not send off a branch to the costal margin as in both of the others. In the fore wings *difficilisella* and this genus send two branches from the discal vein to the posterior margin; in *Evippe* there is a single furcate branch which, like the two separate branches in *difficilisella*, arises about the middle of the discal vein, whilst in this genus they arise close together and to the the median vein. The palpi in *Evippe* are more elongate and slender, with the scales more appressed, and the terminal joint is if anything a little longer than the second. *Eidothea* scarcely differs from *Evippe* as to the palpi and resembles it in ornamentation, but the posterior wings are more excised beneath the tip, and have no discal branch vein, and the discal branch vein of the fore wings is simple and nearer to the median vein. The neuration of *Helice* is that of *Eidothea*, except that the costal vein in the hind wings goes to the tip instead of attaining the margin before it, and the wing is even more excised beneath the tip, and in the fore wings there is no discal branch vein, but the apical branch of the median is furcate. The palpi, however, resemble those of *G. difficilisella* more than those of *Eidothea*. *Agnippe* is more distinct, though the neuration of the fore wings only differs from that of *Evippe* in having only two instead of three subcosto-marginal branches before the end of the cell. It resembles the species described below in the presence of raised tufts on the fore wings, but the position in repose (resting upon the face with the apex of the body elevated) is nearer to that of *Argyresthia* than *Gelechia*, and the length of the third joint of the palpi, relative to that of the second joint, is rather greater than in *difficilisella*, though less than in *Evippe*, and the form is more robust than that of either of the other sub-genera.

SINOE, *gen. nov.*

Generic characters as above and *ante v. 4, p. 192.* It is perhaps necessary here to advise some correspondents that specimens which they formerly received from me labelled *Sinoe ambroseaiella* — the name formerly attached to them in my cabinet before they were carefully examined — belong to a somewhat aberrant species of *Butalis (B. matutella*, Clem.) and are not congeneric with the species described below.

S. fusco-palidella. N. sp.

Pale sordid fuscous; third joint of the palpi white, with two wide dark brown annulations. Face with faint purplish reflections. On the fore wings, just within the basal fourth, is a dark interrupted dorsal streak of raised scales, pointing obliquely backwards towards the middle of the wing; behind this streak and just within the dorsal margin, is a minute tuft of dark brown raised scales, margined behind by a few whitish scales: nearly opposite to this minute spot, but a little behind it, is a somewhat larger one similarly margined; further back, just within the dorsal ciliae, is a rather large dark brown patch of raised scales, which is internally margined by a dark brown streak of scales not raised, which passes back through the middle of the apical part of the wing but does not go to the apex; just beyond this streak is a small oblique costo-apical dark brown streak which attains the costal margin close to the apex; there is a row of dark brown spots around the apical margin, and there are three indistinct pale brown oblique costal streaks, one before the middle, one about the middle, and one just before the ciliae. In some lights these three costal streaks or stains are invisible. There is also a small brown spot about the middle of the base of the fore wings, and there are also some small ones on top of the thorax, two of which are on the posterior margins just before the apex. *Al. ex.* 3/8 inch. Kentucky.

TAYGETE, *gen. nov.*

I erect this genus for the species which, as the name indicates, I have found it difficult to locate, the species referred to above as *G. difficilisella.* Recognizing its differences from the true *Gelechia,* I at first (*ante v. 4, p.*

65) placed it in *Evagora*, to which it makes an approach in some respects, but as it could not with strictness be placed in that genus, I removed it (*v. 4, p. 192*) to *Gelechia*. But unless *Gelechia* is to remain a miscellaneous waste box, it cannot properly be placed there, and I there fore erect this genus for it. See *v. 4, pp. 65 & 192* for the generic and specific characters.

REMARKS ON LIMENITIS PROSERPINA AND ARTHEMIS.

BY W. H. EDWARDS, COALBURGH, W. VA.

It seems probable to me that *Limenitis proserpina* will be found related to *L. arthemis*, the two being forms of one species, as in *Grapta comma* and *dryas*, and I desire to call the attention of Lepidopterists who live where these species or forms are found, that they may observe them from this point of view. They are alike in size and shape, and so far as my experience and that of Mr. Mead goes (confined in both cases to the Catskill Mountains), they are always associated. I notice in a late paper by Mr. Grote that among a number of *arthemis* taken in western New York, was a certain proportion of *proserpina*. The under side of these two forms, excluding the white band, is essentially the same thing. I should like to know the Northern range of *proserpina*, and whether up to the limit of such range it is found wherever *arthemis* is found; and whether it is anywhere found where *arthemis* is not; and whether it is known anywhere to associate with what is undoubtedly *ursula*.

I formerly received large numbers of *arthemis* from high up in British America, Slave Lake to Fort Simpson, and with them were no specimens of *proserpina*. Like the black female of *turnus*, the last may have a limit beyond which it does not pass. On the other hand, the range of *arthemis* is limited to the south, and I am not aware of *proserpina* having been found apart from *arthemis*, while *ursula* swarms throughout the low lands of the Middle States, and throughout the South. If *proserpina* is found nowhere but with *arthemis*, this fact and the several points of resemblance between the two forms, makes the dimorphism probable. But it still remains to be proved beyond question by breeding, that these forms

are species from eggs laid by captive females of one or either, and this can easily be done, in the way I have elsewhere indicated, by any one taking the trouble to attend to the matter on the spot. A strong point in favor of the identity of these forms would be a great similarity between the larvæ that produce them. The young larva of *arthemis* I know, and it is essentially different from that of *ursula*. I expect the larva of *proserpina* to exhibit the form of *arthemis*, and not of *ursula*. It would not be difficult to establish the facts one way or other next spring, to some of your readers.

NOTE ON CATOCALA WALSHII, Edwards.

BY AUG. R. GROTE, BUFFALO, N. Y.

I have received, through the kindness of Mr. C. V. Riley, a specimen of this fine species which has been heretofore unknown to me. It is, perhaps, a little larger than *unijuga* and very different in character (also, therefore, distinct from *junctura*, from my recollection of that species in the British Museum); it resembles the European *elocata* in the appearance of the forewings: these are evenly intensely powdered with dark scales on a grey ground color which becomes yellowish brown over the median spots and subterminal space. The species thus differs strongly from *Meskei*, in which the forewings are pale grey and resemble in color more distantly those of the European *electa*, or perhaps our American *parta*. There is a more prominent discal tooth on the t. p. line in *Walshii*, wanting in *elocata*. On the hind wings the median band is much as in *Arizonae*, narrower than in *Meskei* or *unijuga* (in which it is broadest) and not continued below vein 1, whereas in *elocata* it attains the internal margin. Beneath, the band is narrower than in *elocata*, and also non-continuous. The median spots on the fore wings above are more like *elocata* than *unijuga*. On the hind wings the inner edge of the marginal band is much as in *Arizonae*, *even*, not ragged as in *elocata;* the ante-postical sinus is *cleanly cut*. Beneath, the white bands on the primaries are broader than in *elocata*, and even than in *unijuga*, and the space between the median band on the hind wings and the marginal band is wider on either surface in *Walshii* than in either of its allies. The red of

the hind wings is more pinkish, like *Arizonae* (a species totally distinct in the color and markings of the primaries), and brighter than in *elocata*, not like *unijuga*, where it is less pinkish and more like *parta*. My specimen of *Walshii* expands 82 m. m.; *elocata* averages about 78 m. m. The band in the European *nupta* on the hind wings is abbreviate, discontinued, broad and angulated or elbowed, hence very different from our American *Arizonae*, *Meskei* and *Walshii*, in which, though discontinued, it is not angulated, but is narrower, hardly constricted and straighter and longer. Although, judging by the fore wings alone, we should set down *Walshii* as "representing" *elocata* in America, the very different hind wings separate the two species very clearly. Perhaps *unijuga* is more like *elocata* in the hind wings, and *Walshii* in the appearance of the primaries; hence the European *elocata* seems a compound of both of our species.

BOOK NOTICES.

Fifth Annual Report on the Noxious, Beneficial and other Insects of the State of Missouri. By C. V. Riley, State Entomologist.

This valuable report, consisting of 160 pages, 8vo., is full of interest to the agriculturist as well as the entomologist, detailing as it does the habits and history of many of the foes which the farmer and fruit-grower is obliged to fight. It opens with a chapter on collecting, studying and preserving insects, which is followed by one on noxious insects—notes of the year. In this latter, among other interesting matters, a discovery is announced which will probably prove to be a very important one, that of the finding of two parasitic insects which attack the worm of the Codling Moth. One of these *Pimpla annulipes* is said to have been common in the West during last year, Mr. Riley having obtained 21 parasites from 162 cocoons of the Codling Moth.

A large space is devoted to the Grape Phylloxera, an insect whose ravages, especially in Europe, appear to be exciting increased comment; it is one also to which Mr. Riley has paid special attention. Further observations on the Oyster Shell Bark Louse are recorded, also on the Pine Leaf Scale Insect. Following these are chapters on "Eggs in and on Canes and Twigs," "Stinging Larvæ," "The Goat-weed Butterfly,"

and the Yucca Moth. The work throughout is admirably illustrated with seventy-five wood cuts, most of which have been drawn from nature by Mr. Riley himself. We heartily commend this excellent report to all those interested in Entomology, and we feel assured that the valuable series of reports which have from time to time been issued by this pains-taking observer, have done very much in the way of instructing the readers in this important branch of natural history, while the practical remedies suggested for the various insect pests have no doubt been the means of greatly lessening the yearly loss occasioned by them.

Third Annual Report on the Noxious Insects of the State of Illinois. By Wm. Le Baron, M. D., State Entomologist.

Dr. Le Baron is doing good work also in Illinois. His third report contains 76 pages 8vo., and is illustrated with occasional wood-cuts. It is divided into two parts; the first part treats of insects injurious to the Apple and the Cotton Wood, to which is appended a chapter on the transportation of useful insect parasites. Among apple insects the history of the codling worm is minutely detailed and interesting tabular statements given of the results of using bandages on the trees as traps for the worms. The second part is devoted to "Outlines of Entomology," in which reference is made to the structure of insects both internal and external—their metamorphoses, instincts, their classification and division into orders. The extensive circulation of such yearly reports as these two we have referred to cannot fail to increase the interest already felt in Entomology among a large class of intelligent agriculturists.

Bulletin of the Buffalo Society of Natural Sciences—Nos. 2 and 3.—No. 2 opens with an excellent paper on new species of Fungi, by Charles H. Peck, in which appear descriptions of 132 new species, a most valuable contribution to our knowledge in this department of natural history. From the fertile pen of our esteemed friend, Aug. R. Grote, there follow: "Contributions to a Knowledge of North American Moths," and "A Study of North American Noctuidæ." In the former paper the author makes some suggestions in reference to classification, and in both are contained many descriptions of new species, which are illustrated by two lithographic plates; full catalogues are also given of the species in many families, with recent corrections as to names. In these papers are evidences of much and careful study; Mr. Grote well deserves the hearty thanks of all American Lepidopterists for his zealous labours.

Part 3 contains a paper on the distribution of North American Lichens, by Heny Willey, and *seven* papers by Mr. Grote, on our Lepidoptera. In one of these, "Descriptions of Noctuidæ principally from California," there are descriptions of twenty-five new species, besides numerous interesting notes on many previously described. We trust that this excellent publication will meet with that cordial support from Entomologists which it deserves.

Synopsis of the Histeridæ of the United States. By GEORGE H. HORN, M. D., Philadelphia, 8vo., p.p. 87, with one plate.

We are indebted to the author for a copy of this synopsis, a most valuable contribution to our knowledge of the Histeridæ. We sincerely hope that this elaborate publication may do much towards clearing up the obscurity which has so long attached to many of the species composing this difficult family of Coleoptera.

INTIMATION.--A letter from Mr. J. Behrens, San Francisco, California, with several interesting papers received from other esteemed contributors, are unavoidably deferred until next month for want of space.

BOOKS RECEIVED.

Synopsis of the Histeridæ of the United States, by George H. Horn, M. D., 8vo., pp. 87, with one plate.

Lepidoptera, Rhopaloceres and Heteroceres, No. 6, by Hermann Strecker, Reading, Pa.

Synopsis of the Thysanura of Essex County, Mass., by A. S. Packard, jr., 8vo., pp. 29.

Description of New American Phalaenidæ, by A. S. Packard, jr., 8vo., pp. 29.

Notes on North American Moths of the families of Phalaenidæ and Pyralidæ in the British Museum, by A. S. Packard, jr., 8vo., pp. 15.

Bulletin of the Buffalo Society of Natural Sciences, vol. 1, No. 2.

Prairie Farmer, Chicago.

Indiana Farmer, Indianapolis.

Maine Farmer, Augusta, Me.

Rural New Yorker, New York.

Monthly Journal of Education, November, Toronto.

American Agriculturist, November, 1873.

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American Naturalist, November, 1873.

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Errata.—Page 224—fourth line from bottom, for mine, read mire.

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